Products finishing

Volume 11 FEBRUARY, 1947 Number 5

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Personnel Assets---

A common problem in the finishing department is one of finding satisfactory supervisory and operating personnel. Too frequently, the method of selecting a finishing superintendent or foreman is to pick a man of no capacity from some other production department with the expectation that he will soon learn the problems and the methods of the finishing room. This is such a common practice that its pitfalls should be stressed. There is no doubt that such a man will learn the operations within a reasonable period of time, but he can scarcely be expected to develop the proper prestige for a key position when he must learn the game from those under him.

The proper operation of the finishing department also includes strict methods of proper housecleaning. Dirty spray equipment will not function properly, creates delays and poor quality finishes. If it is not practical to allow the operators time to clean their equipment after use, special groups should assume these duties immediately after the operators leave.

If possible, new material should be checked for conformity with specifications, as it is received. Proper mixing of the material should be under the supervision of an established control, and the mix must be maintained from day to day without variation.

Larger consumers of finishes usually have some form of technical organization to assume responsibility for the evaluation of finishes for their special use. Consumers of smaller quantities of finishes cannot ordinarily afford such technical personnel and are, as a result, largely dependent on the advice and help of the supplier. The finish manufacturer usually has a very cooperative technical liaison with him to aid in the full development for utmost performance and utility of his finishes.

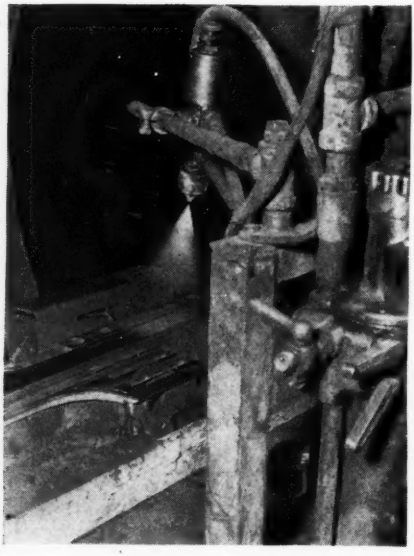
It should be pointed out to operating personnel that production only is not the final answer in the finishing room. Although finishers may be turning out a production of 1,000 articles per hour, this speed is of little value if 25 to 50 per cent of the finished articles are rejected during inspection. A study will often determine whether an unusually large per cent of rejects is occuring, and steps should be taken immediately to correct this. Naturally, there will be a certain percentage of rejects, and it is assumed that the recoating of these must be provided for as capably as production finishing.

Electroplating at Flint's AC Spark Plug Division

By BRYANT W. POCOCK

FLINT'S AC Spark Plug Division of General Motors Corporation's, Dort Highway Plant, possesses what are considered to be among the finest electroplating installations found anywhere. Chief reasons for the respect with which these installations are held include their size and arrangement and their up-to-the-minute gadgetry, which has been calculated to make of plating and allied operations as pleasant and profitable an experience as possible for all concerned.

Fig. 1—View of automatic buffing installation at AC Spark Plug Division, showing method of spraying buffing compound directly on parts



From the production standpoint, AC's plating department comprises two fundamentally distinct sections—the die-cast and instrument divisions—each with its own general foreman. These sections differ essentially only because of the nature of the parts being plated. The die-cast division handles the plating of copper, nickel and chromium on exterior zinc base die-cast parts such as hood ornaments, grille moldings, emblems, and so on. The instrument division takes care of similar plating on instrument bezels, retainers, cases, pointers, trim strips, and so on, the basis metal being 1010 or 1020 steel or brass. In the instrument division, any automotive part comprising a visible portion of an instrument is plated with copper, nickel and chromium. Cases are usually zinc plated. Some retainers are copper plated only for special decorative effects, customer demand being the criterion.

Specifications are set up by the customer in all cases, although these usually coincide with existing General Motors specifications. A typical example of a specification in the die-cast division calls for a minimum of 0.001 inch total thickness of all 3 metals on

Fig. 2—AC Spark Plug Division's installation of huge Hanson-Van Winkle-Munning full automatic for zinc. Taken from open end, this view shows arrangement of sliding doors for access to tanks from either side. Note closed housing to promote adequate ventilation.

parts above the hood line, with corresponding minimum of 0.0015 inch on parts below the hood line. The amount of initial buffing done on a casting is specified by the customer, as is also the amount of buffing done after copper and nickel plating, although the possibility of buffing off some of the plate must always be considered in arriving at ultimately acceptable specifications.

Specifications in the instrument division as a rule require a total plate of 0.00075 inch. In automatic buffing, as shown in Fig. 1, buffing compound is sprayed on the parts and not on the wheels. It has been the experience of AC engineers that this not only results in a saving of buffing compound but saves wheels as well. Furthermore, uniform buffing is obtained by this method, with buffing being readily controlled and rapid and clean working conditions.

Figure 2 shows AC Spark Plug's huge automatic installation for zinc, a unit in the instrument division. This is a Hanson-Van Winkle-Munning installation. The illustration shows the interior of the unit from the open end and reveals the efficient design which incorporates good lighting and accessibility of all tanks, racks, hooks, and so on, with complete closure to take care of and provide for adequate ventilation. Access is obtained to all parts of the interior of the unit through sliding windows which are located on both sides of the installation.

The zinc automatic is used to produce bright zinc plate to meet any specification desired by the customer. In the first operation of this sequence, the parts are racked. They are then cleaned electrolytically for 120 seconds in a solution having the following constants:

Caustic soda ____2.7 oz./gal.
Trisodium phosphate _2.7 oz./gal.
Soda ash ____2.7 oz./gal.
Temperature __180-20 degrees F.
E. M. F. ____6 volts, cathodic

Cleaning is followed by a 22-second cold water rinse, and this by an acid dip for 90 seconds at R.T. in sulfuric acid of 10 per cent concentration by volume. Another 22-second cold water rinse follows the acid dip, the next step being a 44-second soak at from 160 to 180 degrees F. in a 4 oz./gal. concentration of soda ash. A 10-second cold

water rinse follows the alkaline soak cleaner.

Zinc plating is now done for a total time of 10 minutes and 12 seconds in the following bath:

Zinc oxide	7 oz./gal.
Sodium cyanide	15.2 oz./gal.
Soda ash	2.0 oz./gal.
Caustic Soda	12-14 oz./gal.
Du Pont RH 309	0.16 oz./gal.

Operating control maintains the zinc bath within the following specifications:

Zinc metal	5.6 oz./gal.
Total cyanide	2.7 times metal concentration
"M" ratio	2.7
Caustic soda	12-14 oz./gal.
Du Pont RH 309	1 qt./1000 gal./day
Hypo	20 lb./1000 gal./day
Temperature	95-105 degrees F.

Anode baskets are kept filled with zinc balls spaced as required to maintain the metal content of the solution. The bath is filtered into a storage tank each week, the tank cleaned and the solution returned to the tank. Contamination by cadmium and lead is removed by dissolving ⅛ oz./gal. of hypo in warm water, adding this to the bath and filtering. Copper contamination is removed by sprinkling 0.05 oz./gal. of zinc dust over the top of the bath, stirring and filtering out the precipitate.

Zinc plating is followed by two cold water rinses, the first being 20 seconds and the second 22 seconds. A 10-second bright dip is then specified in 0.50 per cent by volume of nitric acid at R. T., followed by a cold water rinse for 44 seconds. At this point the parts receive a 28-second chromic acid rinse, which is followed by a 22-second cold water rinse and a 28-second hot

Fig. 3—Portion of AC Spark Plug Division's barrel plating section

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Fig.4—View of Spark Plug Division's miscellaneous plating section. Note well-drained board catwalk and clear aisle space, also well-designed ventilating hoods.

rinse, then hot air dried for 6½ minutes.

Where thicknesses of zinc are to be checked by the AC strip test instead of by Magne-gage, the stripping solution (antimony trichloride in hydrochloric acid) is maintained at 70 degrees F. The part is immersed, and the time in seconds before gassing ceases is called the stripping time.

Figure 3 is a view of AC's barrel plating division, showing barrel plating equipment in the background with still tanks in the right foreground. This is also a portion of the instrument division, although some die-cast parts are plated in this area. Bright zinc is plated on steel parts such as fuel pump parts by the horizontal barrel process to meet the customer's specification, according to the following sequence of operations:

1. Parts placed in nichrome wire baskets.
2. Parts cleaned electrolytically in following bath:

G. M. 2401-M Cleaner____4.0 oz./gal
Caustic soda _____2.0 oz./gal.
Temperature _____180-210 degrees F.
E. M. F. _____6 volts, cathodic

3. Cold water rinse.
4. Muriatic acid dip, concentrated, R. T.
5. Cold water rinse.
6. Alkaline dip, same as (2) with no current.
7. Cold water rinse.
8. Parts placed in plating barrel.
9. Parts zinc plated to requisite thickness in bath identical with that used in automatic installation shown in Fig. 1.
10. Cold water rinse.
11. Cold water rinse.

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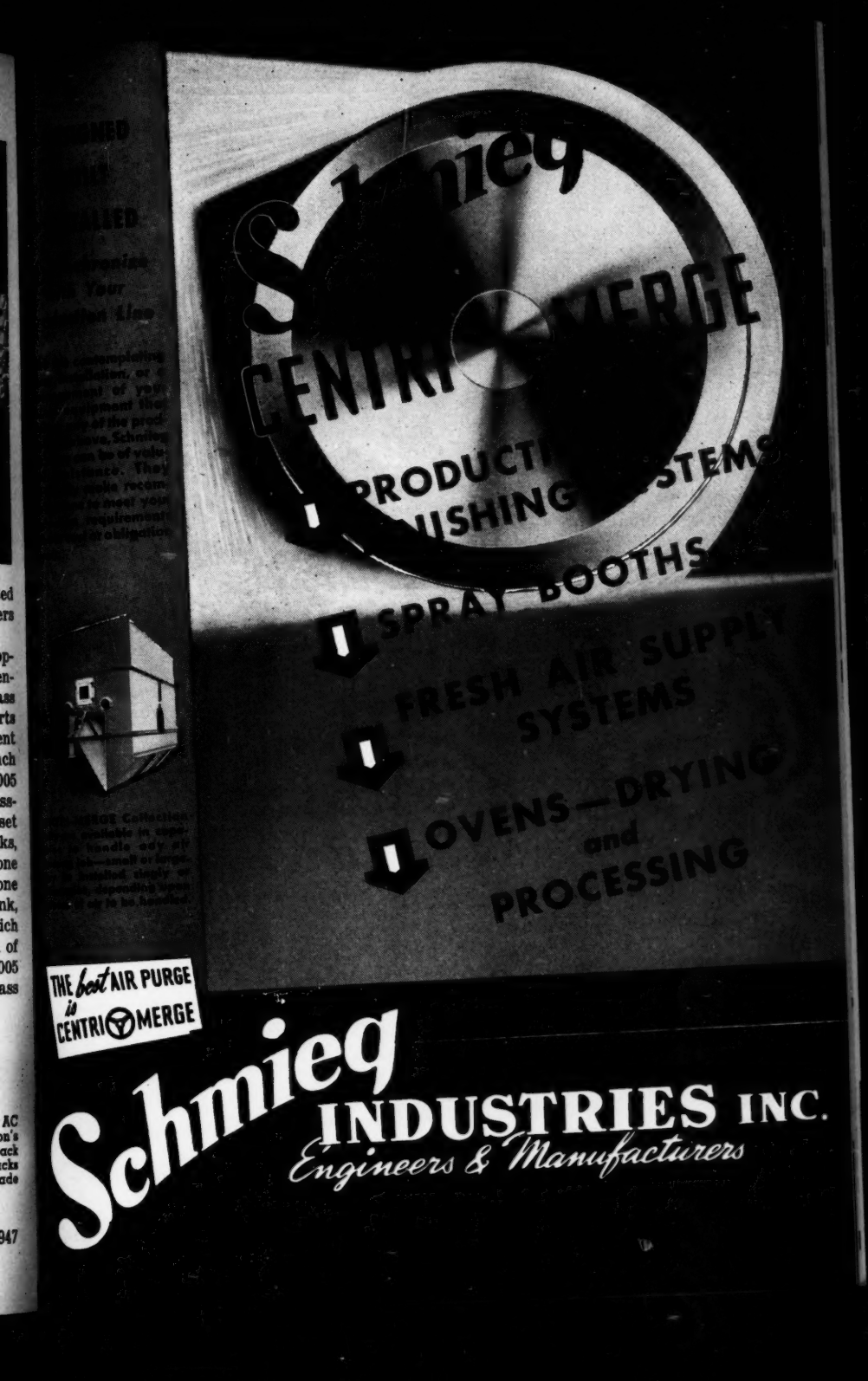
Fig. 5—Shirley D. Story and Sylvia Stanwick, AC Spark Plug Division employees, rack speedometer pointers in preparation for plating in miscellaneous plating section.

12. Bright dip, nitric acid, same as in automatic.
13. Cold water rinse.
14. Hot water rinse.
15. Parts dried in spiral dryer.

Figure 4 shows a portion of AC Spark Plug Division's miscellaneous plating section, including the typical board dock, wide and clear aisle space, and well-designed ventilating hoods. Figure 5 is another view of the miscellaneous plating area, showing AC operators racking speedometer pointers in preparation for plating. Figure 6 is a portion of AC's well-constructed rack room, where racks and hangers are made and repaired.

Zinc base die-cast parts to be copper, nickel and chromium plated enter the die-cast division to pass through a large buffing area. Parts leave the buffing area in two different directions, those requiring 0.0005 inch of copper and 0.0005 inch of nickel passing through one set of cleaning tanks, one copper tank, one nickel tank and one chromium tank, whereas those which require 0.001 inch of copper and 0.0005 inch of nickel pass

Fig. 6—Interior of AC Spark Plug Division's well - constructed rack room, where all racks and hangers are made and repaired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through a different cleaning area and a different copper tank before joining the other parts in their copper tank. Adjacent to this entire area of the plating department are the instrument buffing area and the huge copper, nickel and chromium automatic installation for instrument parts.

Bright composite copper-nickel-chromium plate is deposited on zinc base die-cast brass and steel parts at AC to meet the customer's specification by still tank or automatic operation in the following schedule:

1. Parts are polished and buffed.
2. Parts are racked.
3. Parts are soaked for 6 minutes and 24 seconds at R. T. with no current in an emulsion containing 90 per cent by volume of mineral spirits and 10 per cent by volume of emulsifier.
4. Parts are spray cleaned for 11 seconds in a 2 oz./gal. solution of Northwest No. 45 at from 120 to 140 degrees F.
5. Parts are soaked for 1 minute and 15 seconds in the following solution with no current:

Northwest No. 45 ---------- 2 oz./gal.
G. M. 2424 Cleaner ---------- 2 oz./gal.
Temperature ------ 180-200 degrees F.
pH ---------- 8.6-9.0

Note: Phosphoric acid used to lower pH. Ammonium hydroxide used to raise pH Copper contamination removed by addition of 0.25 oz./gal. of granulated zinc.

6. Parts are electrocleaned for 44 seconds at from 160 to 180 degrees F. in a 6 to 8 oz./gal. concentration of Northwest No. 30, E.M.F. being 6 volts anodic.
7. Parts are rinsed in hot water for

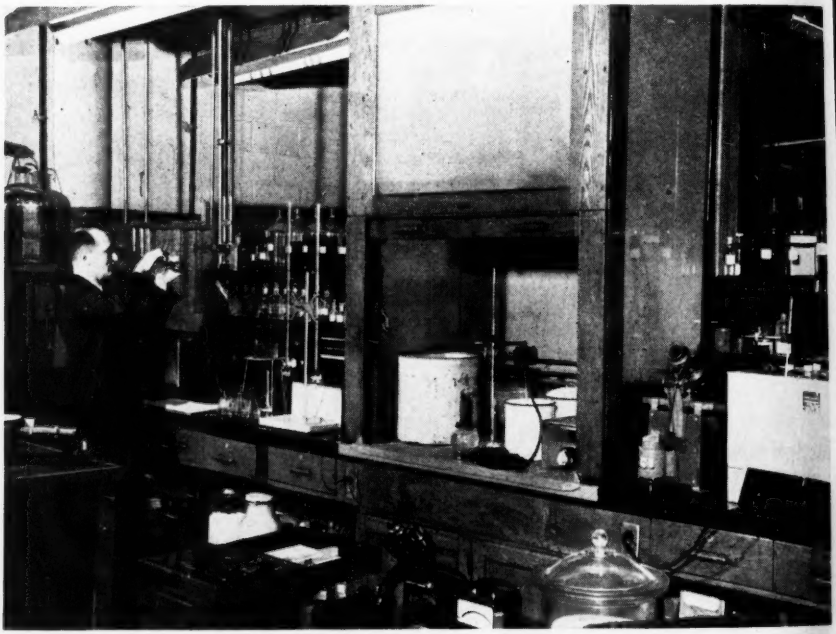

Fig. 7—Arthur Somers, AC Spark Plug Division experimental plating chemist, performing research in well-equipped laboratory. Note Beckman pH meter and binocular microscope in foreground.

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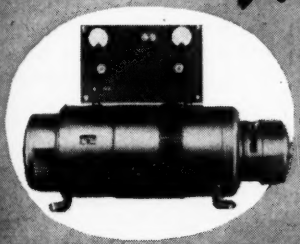

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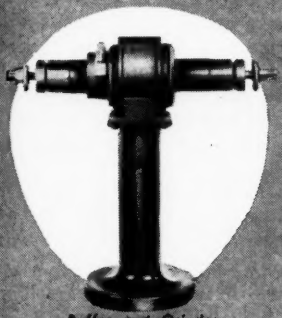

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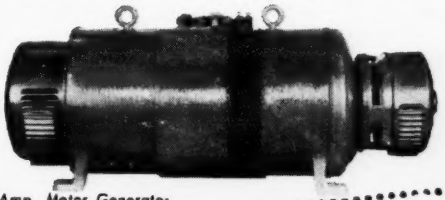

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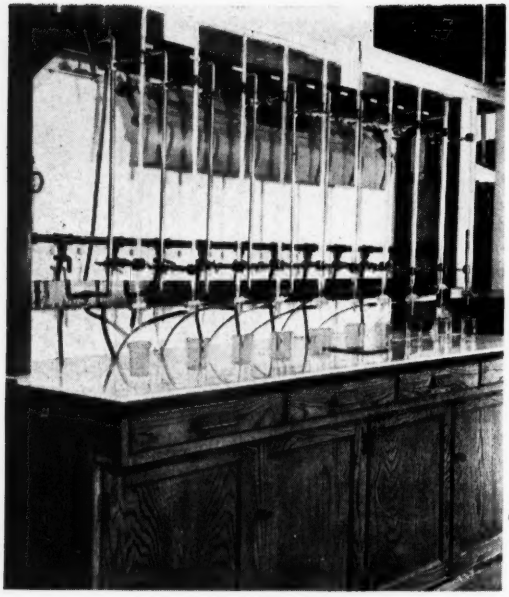

Fig. 8—This illustration provides a view of the well-equipped control laboratory of the AC Spark Plug Division of General Motors Corporation. Note the modern design of the titrating table with white back-lighting behind and beneath row of burettes.

a period of 44 seconds.

8. Parts are rinsed in cold water for 11 seconds.
9. Parts are dipped in a 0.30 per cent by volume concentration of sulfuric acid at R. T., time being 11 seconds.
10. Parts are rinsed in cold water for 11 seconds.
11. Parts are given a copper strike for 1 min. 15 sec. in following bath:

Copper metal ____2.5 oz./gal.
Free potassium cyanide __1 oz./gal.
Caustic potash ____2-6 oz./gal.
Carbonate ____6 oz./gal. max.
Temperature ____140 degrees F.

12. Parts are copper plated for 15 minutes in the following Du Pont high speed bath:

Copper metal ____4.9-8.0 oz./gal.
Free potassium cyanide 1.3-1.75 oz./gal.
Caustic potash ____4-7 oz./gal.
Carbonate ____8 oz./gal. max.
RH 774 ____0.2-0.5 oz./gal.
Temperature ____175-185 degrees F.

13. Parts are rinsed in a solution of hot water for a period of 15 seconds.
14. Parts are rinsed in a solution of hot water for a period of 11 seconds.
15. Parts are electrocleaned for 1 minute and 15 seconds at from 180 to 200 degrees F. in a 10 to 12 oz./gal. concentration of Northwest No. 30, E.M.F. being 6 volts anodic.
16. Parts are rinsed in cold water for 5 minutes.
17. Parts are rinsed in cold water for 1 minute and 15 seconds.
18. Parts are given an acid dip in a 1 per cent by volume concentration of sulfuric acid containing 0.50 per cent by volume of the same wetting agent as that used in the subsequent nickel plating solution. Time is 11 seconds.
19. Parts are nickel plated for 16 minutes in the following bath:

McGean Bright Nickel or equivalent:

Nickel metal ____10 oz./gal.
Nickel chloride ____10 oz./gal.
Boric acid ____ 6 oz./gal.
Brightener No. 1 ___4 pints/1000 gal.
Brightener No. 2 ____0.10 gm./liter
Brightener No. 3 0.20 per cent by vol.
Brightener No. 11 ____7.5 gm./liter
pH. ____2.5-4.0
Temperature ____135-140 degrees F.

20. Parts are rinsed in cold water for 11 seconds.

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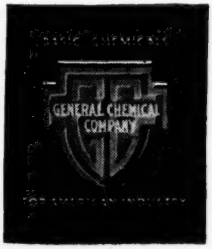

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21. Parts are rinsed in hot water for 1 minute and 15 seconds.
22. Parts are electrocleaned for 44 seconds in the following bath:

G. M. 2401 _____4 oz./gal.
Caustic soda _____2 oz./gal.
Temperature _____180-200 degrees F.
E.M.F. _____6 volts cathodic

23. Parts are rinsed in cold water for 44 seconds.
24. Parts are given an acid dip at R. T. in a 1 per cent by volume concentration of hydrofluoric acid, time being 1 minute and 15 seconds.
25. Parts are chromium plated for 4 minutes in the following bath:

Chromic acid _____33 oz./gal.
Sulfate ion _____ 0.33 oz./gal.
Temperature _____118-122 degrees F.

26. Parts are rinsed in cold water for 11 seconds.
27. Parts are rinsed in hot water for 18 seconds.

Note: Thickness of chromium plate is checked by the hydrochloric acid spot test. Copper and nickel on steel is checked by Magne-gage, on zinc base die-cast by microscope.

Experience at AC has shown that the Du Pont copper bath not only produces a deposit of exceptional brightness but in addition is very economical as a low cyanide user. For example, in July 1946, records show the use of 575 lb. of total potassium cyanide, and 745 lb. the following month. This probably represents only 1/4 to 1/5 the amount that would have been used in a conventional Rochelle salt bath. The Du Pont bath also builds up only 1/4 to 1/5 as much carbonate as is the case with the Rochelle bath.

Chevrolet instrument panels coming by monorail from the punch presses are acid copper plated (resulting in a soft plate) to about 0.0007 inch. These are then vapor blasted, areas which specifications prescribe should remain bright being masked off by steel guide shields. The bright areas are then buffed and the panels passed through the full cycle of copper, nickel and chromium plating and onto assembly. All parts in the department come to the operator on monorail and continues on monorail to the packing department.

Vapor blasting, used extensively at AC Spark Plug, is a development of Vapor Blast Corporation of Milwaukee. This process utilizes 100 p.s.i. air pressure to throw an abrasive which has fallen by gravity after being

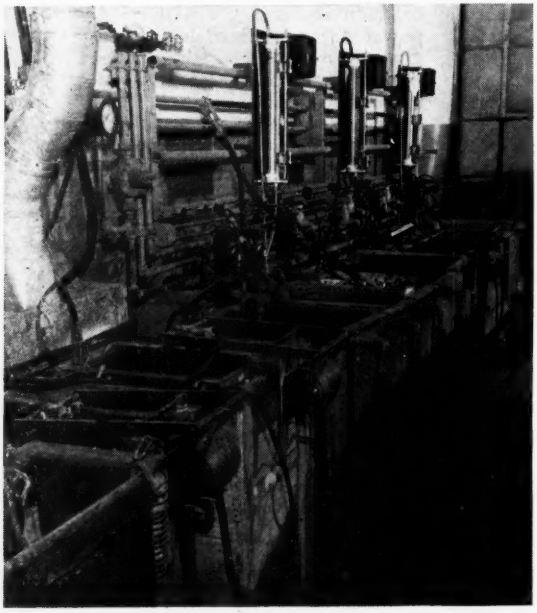

Fig. 9—View of AC Spark Plug Division's experimental laboratory, showing row of experimental plating tanks

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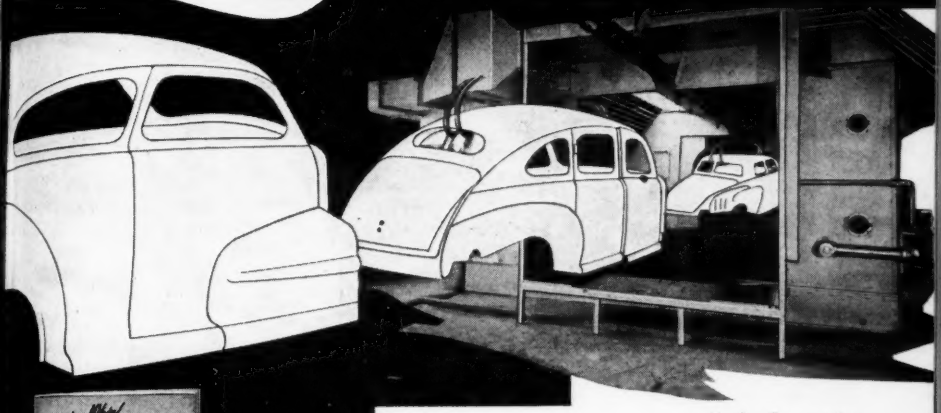

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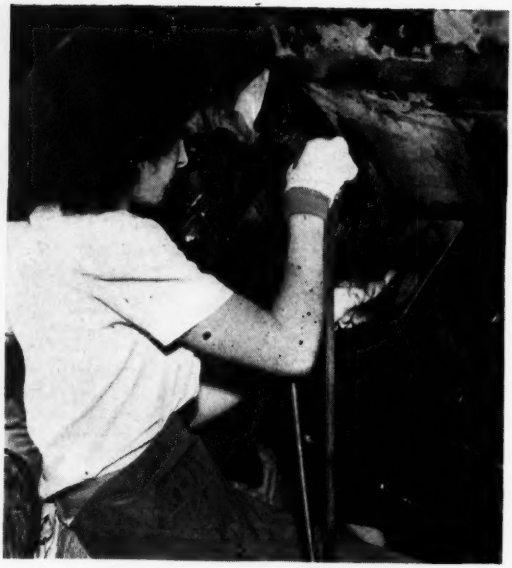


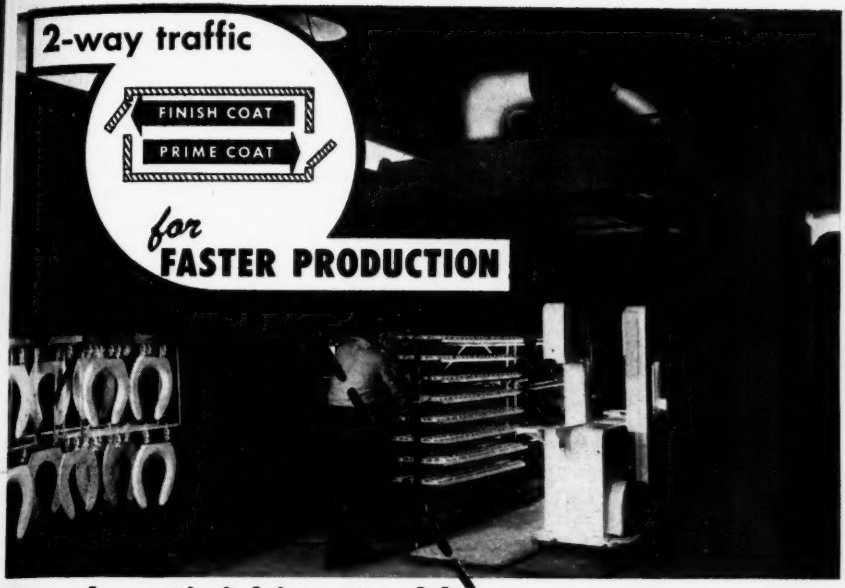
Fig. 10—Joyce McDonald, AC Spark Plug Division employee, paint spraying Chevrolet name plate emblems through electroformed masks developed in experimental laboratory.

pumped into an overhead hopper. It is siphoned down through a hose from the hopper, air pressure forcing it through an orifice at high speed. The abrasive used is a thin, mud type emulsion held in suspension by means of an emulsifying agent. Grit size is 1250 mesh, which is ultra small, most face powders being of the order of 1000 mesh. Chemically, the abrasive is a magnesium oxide.

Characteristic of AC Spark Plug Division is the use of a high flash petroleum solvent blended with a wetting and emulsifying agent as a soak. AC engineers are convinced of the efficacy of this method for removing all types of dirt or soil. An organic amine is used as the emulsifier. AC has developed a "foolproof" fire prevention system. Now, in case of fire, an automatic release system lowers the level of all solvent tanks to allow the carbon dioxide extinguishing apparatus to operate as efficiently as possible. Equipment includes not only the automatic CO_2 apparatus, but a complete duplicate manually controlled CO_2 system as well. Level lowering is accomplished by automatic machinery which empties any solvent tank into an underground storage tank in 3 minutes.

Rather than have plating tanks below ground or on the ground, or high up, AC engineers have placed them on 6-inch concrete piers arranged above a sloping layer of acidproof brick laid over a concrete base. These double layers slope toward a trough of 1 foot x 1 foot cross section. All troughs are connected together and lead through a Duriron pipe to a central sump, and then to an outlet. A careful check has been kept of the pH of the sump liquid, even hourly readings being taken. To date, the pH has never been below 9.0, Flint water having a pH of about 9 due to the large quantities of soda ash used in municipal water softening operations.

Laboratory control and research directed toward the development of new methods and the improvement of existing methods are fundamental considerations at AC as at all progressive plants. Figure 7 shows a portion of AC's control laboratory, where hourly, daily and weekly analyses are made of plating solutions. Figure 8 is another view of the laboratory showing the excellent design of AC's titrating table. Of particular interest are the white background behind the row of burrettes and the white table



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Baking prime and finish coats at the same time, on load lines running in opposite directions, this DESPATCH Batch Oven makes "2-way traffic" really pay! Material flow is faster, handling is simplified and per-unit finishing costs kept down.

Large double doors at both ends of oven make "2-way traffic" an easy matter—a typical result of applying 45 years experience to get the right finishing equipment for a customer. This oven offers new convenience in use . . . it saves floor space . . . can handle more production . . . and it assures low operating costs for quality finishes.

WRITE TODAY! Let DESPATCH tackle your finishing problem! We are still breaking records for prompt delivery and can save you delay and expense in providing the right equipment for your finishing needs.

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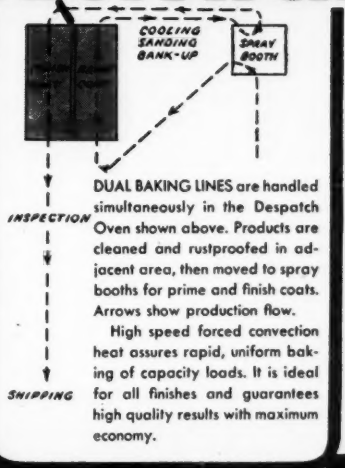

DUAL BAKING LINES are handled simultaneously in the Despatch Oven shown above. Products are cleaned and rustproofed in adjacent area, then moved to spray booths for prime and finish coats. Arrows show production flow.

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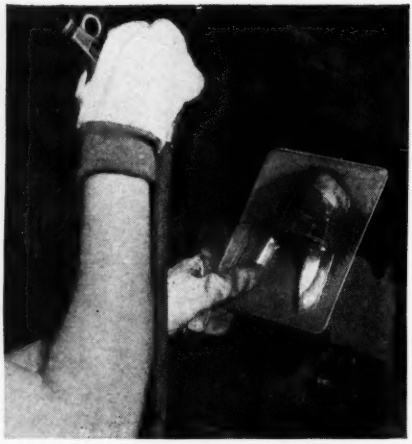


Fig. 11—Close-up of process used at AC Spark Plug Division for paint spraying Chevrolet name plate emblems using electroformed masks developed in experimental laboratory

top. Figure 9 is a view of the experimental laboratory showing a row of ten 15-gallon tanks and two 25-gallon tanks used for experimental electroplating. Figures 10 and 11 show an AC operator using masks as aids in spraying Chevrolet name plate emblems.

The control of pH of nickel baths involves laboratory checks twice a day, as does the control of cyanide in copper baths. All cleaners and acids are checked twice daily. Brighteners used in nickel baths, and metal content, carbonate and pH of copper baths are customarily checked twice weekly. Chromium and zinc baths are checked completely each week, more often if required. All tanks are raked daily to prevent contamination. Additions to tanks are made only upon written authorization from the laboratory.

A word about volume. Production figures naturally vary with changing conditions, but a typical day's run might include the following numbers of parts in addition to a large volume of miscellaneous items: (Instrument Section) bezels, 12,000; instrument panels, 10,000; grille moldings, 4,000; emblems, 4,000; ornaments, 2,000.

DuBois Metal Cleaners. The DuBois Co., Cincinnati 3, Ohio, now has available literature on a variety of metal cleaners, including "Actusol," a process non-caustic non-cresylic cleaner with powerful grease solvent properties; "Sprex," a chemical product for dissolving oil and grease without damage to metal surfaces; "Sprex A.C.," an inhibited degreasing compound for aviation use; and "Actex 200," a powerful degreasing compound in powder form that combines with oil and grease to form a water-soluble mixture which can be easily rinsed or hosed away. Copy free upon request.

Binks Industrial Spray Finishing Systems. The Binks Manufacturing Co., 3114-40 Carroll Ave., Chicago 12, Ill., now has available a catalog containing complete information, including descriptions, photographs, and prices, on a variety of spray guns, spray booths, air compressors, painting outfits, extractors, respirators, hose, and other products. Helpful data on the setting up and use of the various equipment covered are included in the catalog.

Copy of Catalog No. 95 is available free of charge to mechanical executives addressing requests on their company letterheads.

Lustra Rugged Duty Light Bulbs. A four-page illustrated bulletin issued by the Lustra Corporation of America, 40 W. 25th St., New York 10, N. Y., describes four types of light bulbs especially designed for rugged-duty industrial service; namely, Vibration Service lamps with all-flexible construction, Rough Service lamps with flexible 12-anchor filament mounts, Milltype lamps with all-wire shock-absorbing filament supports and other features, and Traffic Signal lamps for continuous "on-off" 24-hour service. Copy of Bulletin No. 103 free upon request.

How Long Should a Rack Coating Last?

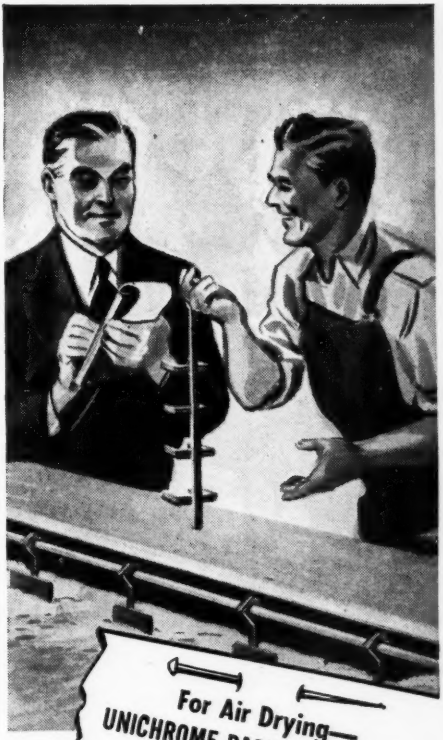
UNICHROME RACK COATING 202

may change your ideas

Some rack coatings start to fail after a few cycles. Some stand up and give good service—until they come up against really tough plating conditions. But platers who use Unichrome Rack Coating 202 tell us they consistently get longer service—under any conditions. For instance:

In the anodizing tank of an automobile manufacturer, Unichrome Rack Coating 202 actually outlived the rack—in 5000 cycles, the contacts wore out before the coating! One metal finisher uses 202 on racks in an electropolishing bath—reports it "the best found for this application." For chromium plating, another says 202 is "far superior to any other rack coating tried."

Try this long-lasting coating in your own plant. You'll cut your expenses by stretching the time between recoating jobs. Unichrome Coating 202 is applied by dipping, and then is force dried into a tough, flexible, adherent non-contaminating coating that resists plating baths, cleaning solutions, shop handling. We'll be glad to test-coat one of your racks without charge. Write your nearest Unichrome office for details.



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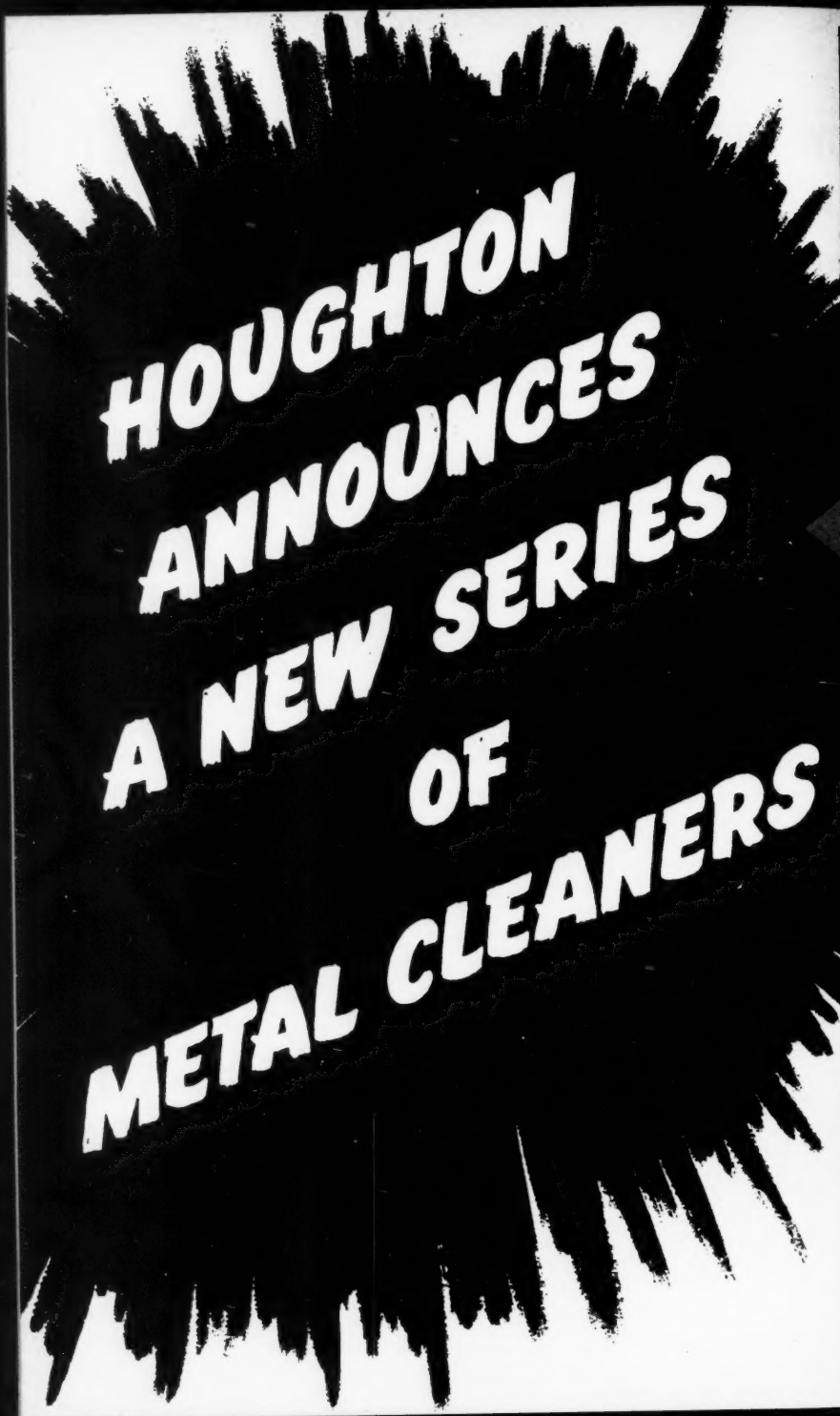
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* *Ultra-violet light was used to evaluate each of the 17 new Houghto-Cleans. Residues remaining on metal plates after various timed periods of cleaning glow with fluorescence, revealing what daylight vision cannot detect.*

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Finishing Clinic

Current Status of Protective and Decorative Coatings and Future Possibilities

By DR. ALLEN G. GRAY

MOST progressive metal finishing engineers fully recognize the fact that the future of metal decorative and protective coatings is closely identified with the technological progress of the plastics industry. The development of new synthetic plastics increases the number of available raw materials, thus contributing to the advancement of coating technology. Future developments will be strongly influenced by current research in high polymer chemistry. New theoretical concepts should result in a better understanding of the factors which control the many characteristics of an organic film, such as drying mechanism, hardness, elasticity, adhesion, solubility, and durability. Also, no doubt, new testing techniques will be evolved. Paint, varnish, and lacquer chemists are thinking in terms of fundamental concepts of molecular behavior.

According to S. P. Wilson in a paper presented before the Second Annual Symposium on "Modern Metal Protection," although there are hundreds of polymerized and polymerizable chemicals falling under the heading of plastic products which may be used as protective coatings, they may be classified under two main headings. These are the **thermosetting,** or heat hardening, types on the one hand and the **thermoplastic,** or heat and pressure softenable materials, on the other. A few materials are borderline cases, acting as members of both groups. The **thermoplastic** materials are, as a rule, completely polymerized as made and are

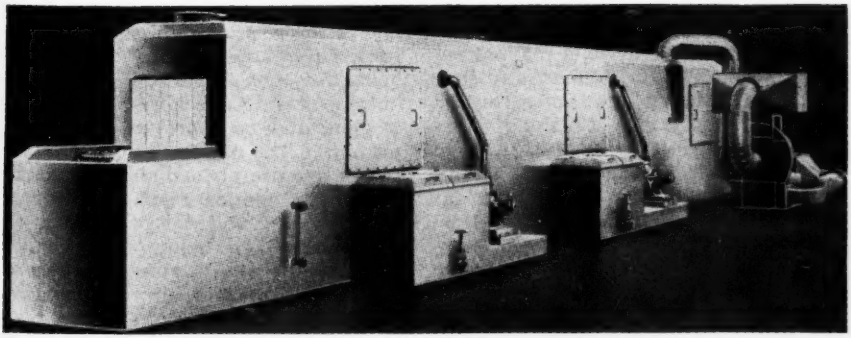
A Monthly Digest on Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

THIS MONTH . . . Current Status of Protective and Decorative Coatings and Future Possibilities . . . Vapor Degreasing and Spray Cleaning Used on Die Castings Prior to Alkaline Cleaner . . . Preparation of Magnesium for Painting . . . Aluminum Coated Steel May Offer Advantages for Many Products . . . A Practical Method for Stripping Copper . . . Formation and Application of Phosphate Coatings.

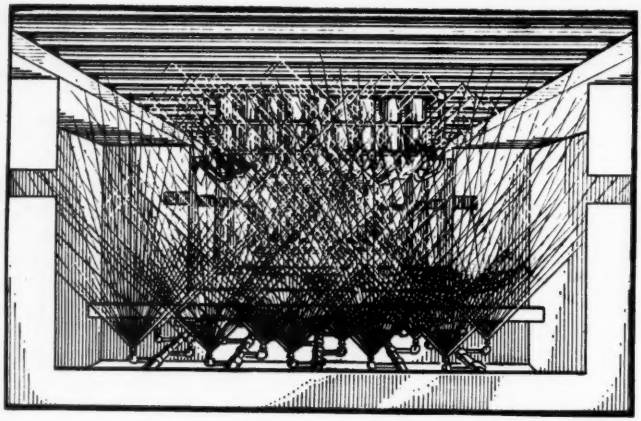
deposited from solution or suspension without further chemical change involved. The **thermosetting** products are used in a partially converted condition, the final curing to an insoluble, infusible, corrosion-resistant film being obtained after application by baking.

The oldest member of the **thermosetting** group is the condensation product of phenol and formaldehyde. When this reaction is carried to its limit, an insoluble, infusible resin results, which is very useful as a structural material but not as a coating. The reaction can be interrupted, however, at a point where the resin is soluble in alcohol, and this can be applied to a surface on which the final conversion can be achieved. The converted film rates very high with regard to corrosion resistance against a wide variety of materials. One U. S. Navy specification for such a product required resistance for 5,000 hours to such individual tests as moving sea water, hot oil at 200 deg. F., water at 212 deg. F., acetone, alcohol, gasoline, and toluol. It also required adhesion without film rupture if heated to 450 deg. F. for 10 hours or kept at 50 deg. F. for 100 hours. This type of coating is usually applied by the dip or spray method from an alcoholic solution at from 20-30 per cent solids, giving a dry film of 0.5-0.75 mil. thickness. A good average baking schedule for one coat is 325 deg. F. for 40 minutes. For some objects, notably metal pipe, the use of induction heating and dip coats makes possible continuous rapid coating, the bake being shortened to around 5 minutes. Pipe so coated has been given field tests of 4 to 6 years in corrosive soils with success, while boiler tubes operating at 212 deg. F. inside and 675 deg. F. outside have stood up for three years satisfactorily.

The deep amber color of the phenol-formaldehyde type of finish precludes the manufacture of white or pastel colors. Where the decorative element is important and where chemical resistance need not reach the maximum level, another group of thermoplastic products becomes of prime industrial value. These are the **amine-formaldehyde** resins, condensation products of formaldehyde and amino compounds, such as urea of melamine. Condensed with higher alcohols, such as butyl or capryl, water white resins, soluble in aromatics and heat convertible to a colorless film, are obtained. If used alone, films of great hardness but poor adhesion and gloss are obtained, with the result that they are usually modified with drying or non-drying alkyd



This three-stage spray washer with mesh belt conveyor incorporates hot alkali sprays, hot water rinse, and hot air blast blow-off.
(Photo courtesy Detrex Corp., Detroit 32, Mich.)



Proper directional spraying is important in spray washing machines.

resins or other plasticizers. The chemical resistance is usually diminished by these additions, but the improvement in other factors warrants this in most of their applications.

These resins are used on home appliances, such as refrigerators, washers, steel kitchen cabinets, fluorescent fixtures, and so on. They afford a complete choice of color, particularly non-yellowing whites, and provide hard, tough, durable films at bakes as short as one minute at 400 deg. F. on thin steel, or 3 to 6 minutes under infra-red on regular production. Their chemical resistance is high against humidity, fruit acids, mild alkalis and detergents, and fats and oils. They are flexible enough to permit coating steel strip and winding in coils for making venetian blind slats. Industrially they are of prime importance and afford an excellent means for finishing mass production steel articles to be used in ordinary environments.

The **thermoplastic** resins are far more numerous than the thermosetting. They can, however, broadly be separated into a few classes. The two most important are the **cellulosic** and the **vinyloid** divisions, in each of which many sub-classes of chemical individuals and copolymers exist. These materials are all high polymers, either natural as in the cellulose compounds, or artificial as in the vinyloid series. The coating consists of a solution or suspension of these high polymers, and application by the dip, spray, roller-coat, or other method provides a film for which an air dry of low bake to remove solvents is adequate.

Among the cellulosic plastics, according to Wilson, the oldest and most important are the nitrocellulose type lacquers, of which many millions of gallons are used annually in finishing metal articles ranging from automobiles to glove buttons. Nitrocellulose, with its modifying resins, plasticizers, and stabilizers, is soluble in a wide range of organic solvents. It may be colored with dyes or pigments to any desired effect or used clear as a coat for silver, brass, or copper to resist tarnish. It dries in the air at room temperature quickly and completely and affords protection against ordinary environments to a degree adequate for such important products as automobiles. Adhesion to clean metal is good and is improved by suitable primers. The nitrocellulose type materials are useful for industrial finishing where chemical resistance requirements are moderate, production requirements high, baking facilities undesirable or unavailable, and decorative requirements of importance. These materials and the amine-resin finishes previously noted are among the most important industrial finish coatings at present employed.

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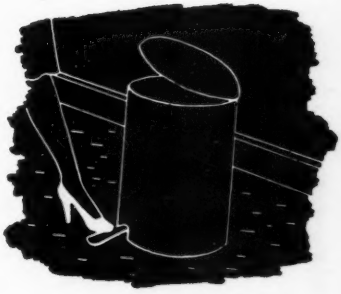

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The most widely used vinyloid, for protective coatings, is the **vinyl chloride-acetate** copolymer. In general the higher the molecular weight of these materials and the higher the chloride percentage, the greater the chemical resistance and the poorer the solubility and adhesion. The solutions run to the viscous side, and high concentrations with suitable viscosity for spray or roller application were not available until recently. This was brought about by a process of dispersing these resins as organosols in non-solvents, in which condition they may be applied at solids contents of 50 per cent or higher, and the aggregation of small particles left as the solvent dries can be flash baked to cause fusion to a smooth, coherent film. In the future, this principle may find application to the still less soluble and more resistant resins now beginning to appear. In general, the chemical resistance of the vinyl coatings is very high. Much of this plastic is applied to sheet metal by rolling, the metal being later shaped into its final form.

The **allyl phthalate** resin coatings form a link between the thermosetting alkyds and the thermoplastic vinyls, in that the film when baked to its upper limit loses thermoplasticity and becomes a very hard, adhesive, and chemically-resistant coating. The chief potential use may be in can linings but as more users become familiar with this recently developed polymer coating further expansion of its field is probable. Also of recent development are two resins based on ethylene; polymerized ethylene, known as **polyethylene,** and the polymer of **tetrafluoroethylene**. Polyethylene has unusually high chemical and moisture resistance. Tetrafluoroethylene is reported to be stable at temperature around 500 deg. F. and to be resistant to all chemicals and solvents.

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Buffing was eliminated!

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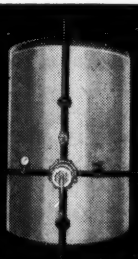

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PF-2

cones, which are derived from silicon linked to carbon complexes and classed as a member of the thermosetting resin family, are reported to have unusual temperature stability and good chemical resistance. Coatings produced from silicones pigmented with titanium oxide give a white coating which is unchanged at temperatures above 400 deg. Fahrenheit.

* * *

Vapor Degreasing and Spray Cleaning Used on Die Castings Prior to Alkaline Cleaner

IN the production plating of zinc die casting with copper-nickel-chromium at the plant of the Electric Auto-Lite Company at Woodstock, Ill., castings coming from the trichlorethylene degreasing units are first subjected to a pressure spray cleaning operation using a proprietory cleaner (see also "The Iron Age," May 30, 1946). The cleaner is applied by spray under a 40 p.s.i. pressure as the racks are conveyed through a booth. The cleaner is kept at a temperature of 160 deg. F. and is recirculated from tanks below the racks where grease and dirt are removed. The high pressure of the spray provides a scrubbing action that helps to remove any dirt or buffing compound that may be lodged in recesses. Parts remain in the spray 2½ minutes and pass through a spray rinse of cold water before leaving the booth.

The castings, suitably racked, are then immersed in a cleaning solution consisting of a proprietory composition maintained at 180 deg. F. where anodic cleaning is carried out for 16 seconds. Current density is 40 amperes per sq. ft. Cleaning is followed by a warm rinse and next by a 15-second dip of the parts in 1 per cent sulfuric acid to slightly etch the surfaces. The castings are then subjected to a cold water rinse, following which they receive a copper strike in the conventional cyanide solution. They are then ready for copper plating.

* * *

Preparation of Magnesium for Painting

IN describing methods used in preparing magnesium for painting before the Second Annual Symposium on "Modern Metal Protection" held in Cleveland, Ohio, R. E. Gwyther of The Sherwin-Williams Company stated that most magnesium products are finished with a protective coating even before final fabrication of the product. This coating is intended to protect the metal during storage, shipment, and manufacture. The chrome-pickle process, known as Dow No. 1 or AMC "A," is used for this purpose. The treatment comprises a short immersion of the work in a solution of nitric acid and sodium dichromate. The coating is suitable as a

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requiring lower air consumption and capable of spraying solutions of all consistencies perfectly. Beach featherweight air brushes are designed and constructed to speed finishing operations *economically*. We carry a complete line of all-purpose paint and lacquer spray equipment, including hoses, tanks, compressors, etc. Consult us concerning any finishing problem. Write for literature.

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for the surface treatment of metals

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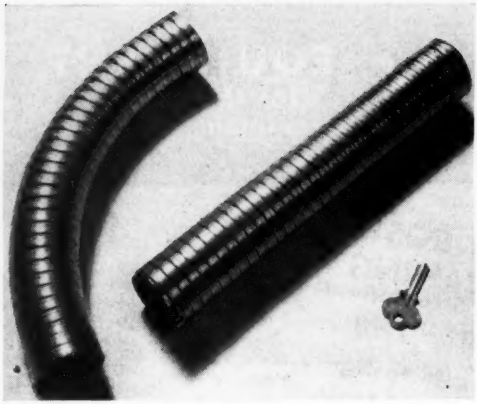

Sections of tail pipe constructed of aluminum coated steel where resistance to heat and corrosion is required (*Photo courtesy The American Rolling Mill Co., Middletown, Ohio*)

paint base but cannot be used where close tolerances are required due to etching of the metal. The dichromate process, known as Dow No. 7 or AMC "G," was reported to be an excellent process for corrosion resistance and one of the most widely used as a base for painting. Typical steps in the process as used in production are listed below:

Step 1—Solvent, vapor, or emulsion cleaning.

Step 2—Alkaline cleaning.

Step 3—Immerse in 10 to 25 per cent hydrofluoric acid solution.

Step 4—Cold water rinse.

Step 5—Immerse 45 minutes in dilute sodium dichromate solution.

Step 6—Rinse cold and hot.

One successful anodizing process for magnesium described by Gwyther before the Symposium was called the Navy PT-13d process, and the steps in the process when used in production finishing operations were given as follows:

Step 1—Clean and pickle.

Step 2—Immerse in 10 to 25 per cent hydrofluoric acid solution.

Step 3—Cold water rinse.

Step 4—Anodic treatment for 45 minutes in dilute sodium dichromate-sodium phosphate solution.

Step 5—Rinse.

This process was reported to provide for unusual corrosion resistance and was said to afford a good base for paints. Its chief disadvantages were reported to be lack of "throwing power," such that the anode parts nearest the cathode are more completely anodized than other parts of the anode being treated.

* * *

Aluminum Coated Steel May Offer Advantages for Many Products

THE successful development and production of aluminum coated sheet steel provide designers and engineers with a new material with many desirable properties for fabrication into a variety of diversified metal products. Aluminum coated steel combines the surface characteristics of aluminum with the mechanical and physical properties of steel. The aluminum coating provides the special advantages of good corrosion resistance, heat resistance, and heat reflectivity, along with an attractive appearance; the core contributes the tensile and yield strength, endurance, and working qualities of steel.

Based on these qualities and characteristics, it is evident that aluminum coated steel is well suited to a wide variety of uses where the corrosion and heat resistance, reflectivity, or appearance of aluminum is desired, along with the desirable properties of the steel base. This is especially true where combinations of corrosion and

This man knows

and trusts AHCOLOID Metal Cleaner uniformity

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He knows that when a specific AHCOLOID Metal cleaner is reordered . . . no matter when . . . the contents of each barrel will conform exactly to the original specifications. Apothecaries Hall Companys' method of pre-testing the ingredients of each formulae and also testing the final mixture, insures complete uniformity.

There is a specialized AHCOLOID cleaner for every industrial cleaning operation with a method of application thoroughly approved by use in hundreds of plants. AHCOLOID cleaning compositions save countless production hours . . . do the job thoroughly . . . quickly.

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WATERBURY 88 CONN.

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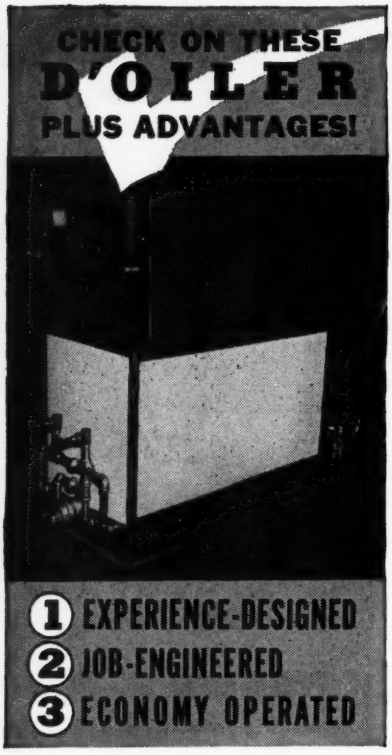
BOX A



FOR THOROUGH METAL CLEANING

The D'OILER Vapor Spray machine, illustrated above, can be used as a vapor-spray, or a straight vapor degreasing unit. Drain table recaptures dragout from basketed parts . . . all-around insulation reduces heat losses . . . exhaust duct on two sides safeguards operator . . . pump drive for standby solvent eliminates hand pouring.

Every D'OILER type is built to do a specific job . . . is designed with the "on-the-job experience" necessary to provide a degreaser that does the work, in the required volume, economically.

Our engineers will gladly advise on degreasing problems; your inquiries will receive prompt attention. Write today.

Mechanical
PROCESS COMPANY
P. O. BOX 88, SOUTH ORANGE, N. J.

heat resistance are essential. Among important present applications for which the material seems well adapted and on which extensive service tests have already been conducted are automobile mufflers and exhaust pipes; domestic range oven liners and interior main bodies; circulating heater parts and combustion chambers of heating furnaces; and heat exchanger tubes for gas furnaces. Aluminum coated steel can also be used for certain parts requiring heat resistance, such as airplane firewalls. Other prospective applications include lighting fixtures, reflectors, and possibly a variety of different types of containers.

Sheet steel is coated with aluminum by a continuous hot-dip process developed by The American Rolling Mill Company and the product, which has a soft, satiny appearance somewhat similar to a sheet of aluminum, is offered under the trade name Armco "Aluminized" steel. For regular use, a dull finish is recommended. Where a brighter appearance and greater refectivity are required, an "extra smooth" grade is available.

The weight of aluminum applied to both sides of the sheet is approximately 0.50 oz./sq. ft., resulting in a coating thickness of about 0.001 inch of aluminum per side. This thickness of coating is said to be greater than terne plate or tin plate coatings of the same weight due to the lower specific weight of the aluminum.

The corrosion resistance of aluminum coated steel, based on laboratory tests in 20 per cent salt spray at 95 deg. F., has been found very good, exhibiting a coating life of 1000 and 2000 hours. Aluminum coated steel will withstand temperatures up to approximately 900 deg. F. without discoloration and up to about 1,600 deg. F. without destructive scaling. The lack of discoloration at elevated temperatures keeps the reflectance of heat and light at a high value.

JETAL BLACK

has 9 lives...

AS A FINISH ON IRONS AND STEELS!

JETAL is a BLACK oxide coating that is tough, long lasting and adaptable. **JETAL** may be resistance or spot welded and soldered. It will not chip, peel, crack, crumble or dust off, even on bending or cutting. There is no dimensional change after treatment. The smooth, dense coating forms a fine base for lacquer, enamel or japan.

JETAL is long lasting. It can be applied in *5 minutes!* Wear resistance and penetration are better than any black on the market. **JETAL** is black BLACK, deep and solid. It costs less and is easily applied by immersion or chemical oxidation, in bulk, baskets or barrels.

JETOIL 1A

Rust is the common enemy of all metals, and JETOIL 1A effectively combats it. JETAL coatings, with JETOIL 1A added as a supplemental oil film for protection during assembly, inspection, storage or in service, do not show first appearance of rust until after more than 50 hours salt spray testing.

OTHER **ALROSE** FINISHES

WHITE

ALROSE CHEMICAL COMPANY

Manufacturing and Research Chemists

PROVIDENCE, RHODE ISLAND • WILLIAMS 3000

The excellent heat-resistant properties of aluminum coated steel accounts for its successful performance when used as a material of construction for mufflers, heat exchanger tubes, and combustion chambers of gas-fired warm air heating furnaces, where the coated steel must possess both heat and corrosion resistance; that is, not only resist destructive scaling at elevated temperatures but, in addition, the corrosive effects of the products of combustion and their condensates.

In many applications, the surface of aluminum coated steel is satisfactory and requires no painting. While the alumium surface is reported to possess certain paint-holding qualities, it is not recommended for direct paint application. Surfaces to be painted should be given a Bonderizing treatment. A "mill-Bonderized" finish is available from Armco on coated strip that is to be fabricated into products which are to be subsequently painted. Finishing engineers will certainly want to investigate this product as a material for the construction of parts requiring a heat-resisting coating as well as unusual corrosion resistance.

* * *

A Practical Method for Stripping Copper

A METHOD for the stripping of copper plate which is of interest to the production man was contained in the report of research project No. 1 of the American Electroplaters' Society, presented at the Society's annual 1946 meeting in Pittsburgh, by F. C. Mathers and E. L. Martin. The recommended method involved the use of a sulfide-cyanide process, wherein the part to be stripped is first treated in a solution of sodium polysulfide. The copper sulfide which is formed is so loosely adherent that, under the best condition, as much as 95 per cent can be washed off in a strong jet of water. This results in a savings of sodium cyanide which constitutes the subsequent treatment, according to the method described by Mathers and Martin.

The recommended sodium polysulfide solution consists of 20 oz./gal. of sulfur and 13 oz./gal. of sodium hydroxide, used at 85 to 95 deg. C. It was reported that the concentration is not critical. Preparation of the solution requires about 30 minutes and consists of dissolving the sulfur in a boiling solution of sodium hydroxide.

Concerning the stripping of copper from zinc base die castings, the report stated that zinc alloys cannot be deplated in cyanide solutions because of excessive corrosion or dissolving of the base metal by the electrolytic action. However, the sulfide-cyanide process was reported to be a satisfactory method for stripping. The sodium polysulfide solution caused a

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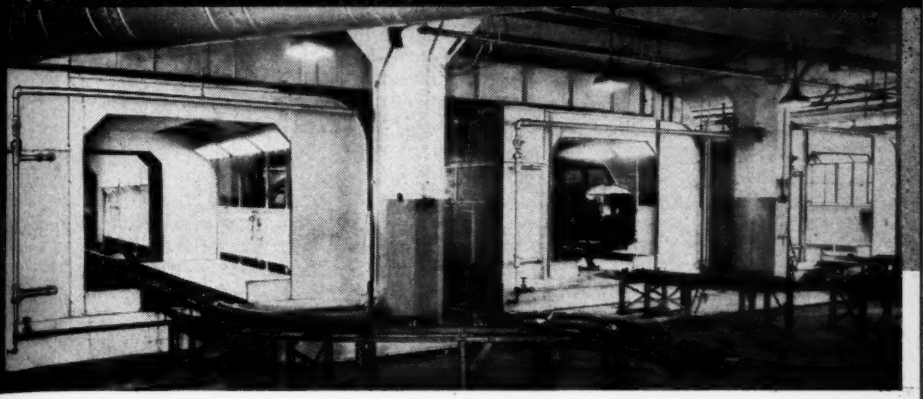

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The illustrations on this page show Mahon Finishing Equipment in operation—complete from Metal Cleaning and Rust Proofing through Drying, Spraying and Baking to Overspray Reclaimation Equipment . . . this equipment is in the automotive industry where fine finishes are imperative. In other industries too—industries all over the world, where finishing constitutes a major production operation—you will find Mahon Complete Finishing Systems. Over twenty-five years of pioneering in this highly specialized field, involving constant research and development, have endowed Mahon engineers with a wealth of technical knowledge and practical know-how not available to you elsewhere. If you are contemplating a new modern Finishing System, or changes in present equipment, call in Mahon engineers—consultation will not place you under obligation.

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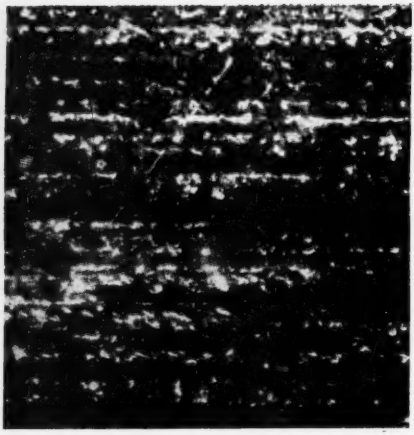
AHON



Photomicrograph of plain polished sheet steel (400X)

loss of 0.001 gram/sq. in. per hour on polished zinc base die castings. The copper sulfide formed with the sodium polysulfide was so loosely attached that it could be very completely removed by a jet of water. As a result, the authors report that such a short treatment in the cyanide was necessary that the corroding action on the base metal was greatly lessened.

* * *

Formation and Application of Phosphate Coatings

ACCORDING to Van M. Darsey and W. R. Cavanagh of the Parker Rust Proof Corporation in a paper presented before the 90th regular meeting of The Electrochemical Society at Toronto, research has proved that the application of an organic finish directly over bare metal is an inferior solution to the corrosion problem. This suggests that the surface of the metal should be made as impervious to corrosion as possible prior to the application of any finish. This latter function is fulfilled by rust-proofing, wherein phosphate coatings are widely used. Protective coatings produced by converting the surface of a metal into a chemical compound of exceedingly low solubility in the environment to which it is to be exposed are being increasingly used.

Within the past few years the use of phosphating in industry to produce surface conversion coatings useful as a base for lacquer or paint adhesion has increased many fold. Solutions for phosphating are marketed commercially under the name of "Bonderizing" and "Parkerizing." The thickness of the standard phopshate coatings, such as Bonderizing, range from 0.00005 to 0.0001 inch. The thickness of the heavier films, such as Parkerizing, range from 0.00015 to 0.0003 inch. Both finishes generally provide about 4 hours of salt-fog resistance when tested without further treatment. Parkerizing, however, accompanied by an oiling operation, can afford 25 to 50-hour salt-spray corrosion resistance, and both Bonderizing and Parkerizing are capable of providing 100 to 200-hour salt-spray corrosion resistance when treated with the proper organic finish.

Phosphating has come to be a short-

Photomicrograph of sheet steel after phosphating (400X)

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A Quality Finish

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TABLE I
Classification of Phosphate Coatings for Steel

Method of Application	Coating Time	Approx. Coating Wt. per Sq. Dm.	General Use	Typical Articles Coated
Immersion	30 to 60 min.	100 to 200 mg.	Corrosion preventive	Nuts, bolts, screws, and small parts
Immersion	2 to 5 min.	30 to 60 mg.	Base for paint, aid for drawing	Stampings, etc.
Spray	1 minute	10 to 30 mg.	Base for paint	Auto bodies, refrigerators
Brush or Roller	3 to 10 sec.	5 to 10 mg.	Base for paint	Sheet and strip stock
Immersion	10 to 15 min.	150 to 700 mg.	Wear prevention	Pistons, rings, liners, gears, etc.

time process. According to Darsey and Cavanagh, many of the new developments in this field have been directed to this end. For Bonderizing in strip mills, the time required can be as short as 7 seconds and in job shops, about 2 minutes. When phosphate coatings are to be considered for an application, one of the primary considerations should be surface preparation.

The phosphating of zinc and cadmium plated surfaces have come more to the foreground in the past few years. A corrosion-resistant and paint holding zinc coated sheet has been developed and is being marketed by the various steel companies under their own trade names. The deposition of the zinc and the phophating are accomplished by continuously passing the properly cleaned strip steel or sheets through an acid type zinc plating bath and immediately following by phosphating and rinsing. The improved paint-holding quality of the phosphate surface and the added protection against corrosion afforded by the zinc layer beneath the paint and phosphate coating assure long service life for such finished parts. Due to the thin and adherent nature of the electrodeposited zinc coating, sheets can be drawn and articles fabricated therefrom can be subsequently painted, since the performed phosphate coating serves as a satisfactory paint base. Shipment and storage of such sheets without rusting makes them especially suitable for many uses.

A wide range of phosphate coatings can be produced on metal surfaces, depending upon the method of application, time of processing, and cleaning prior to phosphating. By the choice of proper solutions and conditions, it is possible to produce phosphate coatings on many metals especially suitable for different uses. A classification of phosphate coatings for steel is given in Table I provided herewith.

"Sun 'Job-Proved' Products for Industry" is the title of a four-page illustrated folder published by the Sun Oil Co., Industrial Products Dept., Philadelphia 3, Pa,. which describes cutting oils, textile and rubber processing oils, general lubricants, refrigeration oils, mine lubricants, Diesel oils, solvents, greases, and waxes. Copy free upon request.

Devine Buffing Compositions are the subject of a catalog page published by the Devine Brothers Co., 220 Seward Ave., Utica 1, N. Y. Described are tripoli compositions, coloring compositions, stainless steel compositions, chrome coloring compound, white finishes, grease stick, emery paste and emery cake, and special purpose compositions. Copy free.

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Light weight aluminum pulley perfectly balanced.

Double-sealed precision-made ball bearings.

Easily changed from right to left by loosening two set screws and reversing shaft.

Rugged all steel construction for a lifetime of trouble free performance; weighs only 165 lbs.

Snubber prevents vibration even with out-of-round contact wheel or irregular work application.

Adjustable Belt Tension maintained by four leaf-type springs.

Broad lateral adjustment for any belt length from 84" to 168" without moving base.

Use any length Belt

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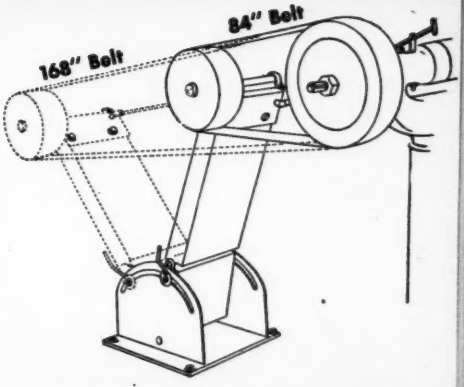


"Has every feature we've ever wanted." That's what users say of the PRESTO Back-Stand Idler. Quickly adjustable for any length belt from 84" to 168". Adjustable spring tension with snubber action—no vibration even with out-of-round contact wheel or irregular work application. Handy angular alignment adjustment. Light weight aluminum pulley, perfectly balanced. Double-sealed precision-made ball bearings. Universal Mounting—works in any position. Easily changed from right to left. Rugged all steel construction. Carried in stock for immediate shipment. Order thru your Jobber or write us.

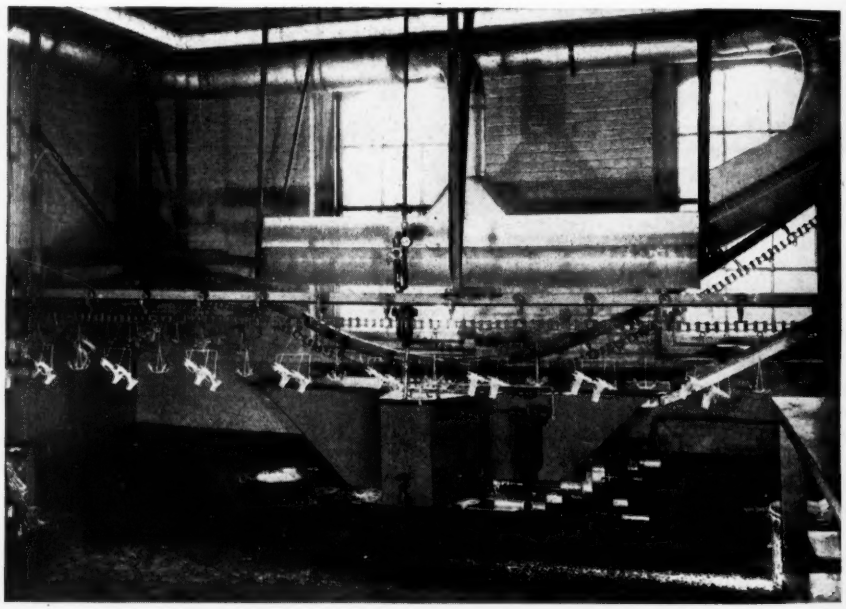
Special Finishing Installation

By E. L. VERHAGEN

Chief Engineer, The Regina Corporation
Rahway, New Jersey

IN connection with the finishing of Regina Corporation DeLuxe wall type can openers, the company was faced with the problem of baking the ivory enamel finish in the shortest possible time and still avoid discoloration. Tests conducted using available oven equipment showed that 30 to 40 minutes would be required to properly bake the finish. However, working with Jensen Specialties, Inc., Detroit, Regina Corporation finally developed a method that reduced the baking time required to 8 minutes.

This was accomplished by the use of a specially designed "dual-heat" infra-red oven with an unusual contour and employing rows of lamps set at criss-cross angles. Due to this criss-cross feature and the even, constant heat afforded by the dual-heat principle, uniform, dependable baking



Can openers parts are shown being automatically dipped in ivory enamel paint at The Regina Corporation using a Jensen-built conveyorized dipping system.

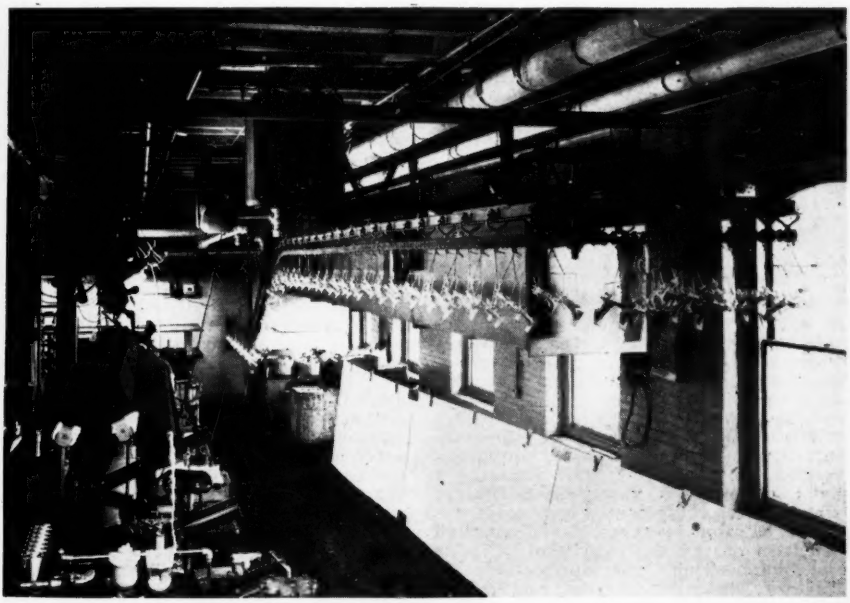
Eliminates Production Problem

was obtained with the oven. All nooks and crevices of the parts are baked equally and with absolutely no discoloration.

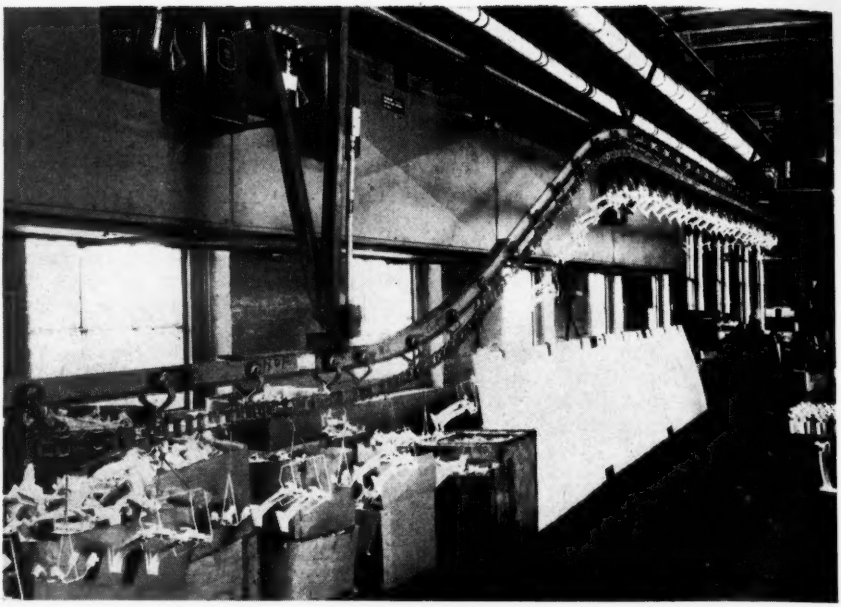
The can opener parts are zinc die castings. After the necessary machining, they are electrolytically cleaned, rinsed, Bonderized, and then rinsed again in cold and hot water.

To handle the finishing job after cleaning the parts, Jensen designed, engineered, and installed a complete conveyorized dipping and infra-red baking system whereby the parts are automatically dipped. Only one coat of ivory baking enamel is required to effectively cover the units, which are sprayed with an air-drying lacquer. A number of suitable holding racks were developed to provide the proper drainage angle for each part and to eliminate the possibility of the paint entering the holes.

After dipping and allowing ample stand-out time, the can openers are conveyed out to and through the ceiling-mounted infra-red oven for paint baking. From there they are conveyed to the cool-down zone, following which they proceed to the unloading



After can opener units leave the paint dip tank and ample stand-out time has elapsed, the units enter a a ceiling-mounted Jensen "dual-heat" infra-red oven for paint baking. This illustration shows the parts leaving the oven and being conveyed to the cool-down zone.



Can opener units are shown here being transferred on a Jensen ceiling-mounted conveyor to the unloading station.

station. The equipment is geared to produce 3,000 complete units in 8 hours.

The ceiling mounting arrangement of the oven and conveyors provides for the conservation of valuable floor space, and the short baking cycle, plus the elimination of stand-by loss and the effective saving of covering material, makes the installation highly successful and efficient for the can opener finishing job.

Corrosion-Resisting Process Equipment. A 20-page general catalog published by The Duriron Co., Inc., Dayton 1, Ohio, provides a general description of each type of corrosion-resisting equipment marketed by the company. The catalog supersedes all general catalogs published by the company and includes information on new alloys and equipment recently developed. It also contains a list of processes in various industries in which Durco equipment is employed.

The catalog describes the production facilities of the company and explains the composition and applications of Duriron, Durichlor, Durimet, and Chlorimet—the main corrosion-resisting alloys of which the company's products are made. The equipment described in the catalog includes Model 40 Durcopumps; Durco valves of many types, including plug, Y, check, angle, float, foot relief, and mechanically-operated models; the new Durco 4H and 4C heat exchangers; Durco split-flanged pipe and fittings; bell-and-spigot pipe and fittings; mixing nozzles; steam jets; immersion tubes; ejectors; tank outlets; kettles; tanks; exhaust fans; sinks, bowls, strainers, traps, and Kjeldahl digestion and wet-ashing equipment.

The calatog tells what Durco alloys each piece of equipment is available in, gives sizes and capacities, and tells the reader what bulletin to request for complete details on any particular piece of equipment. Copy of General Catalog H free upon request.

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Barrel Finishing of Metal Products

Part 6—Continuation of the Discussion on the Tubbing Machine

By H. LEROY BEAVER
Barrel Finishing Consultant
Lansdale, Pennsylvania

IN the January issue we attempted to explain the origin and operation of tubbing machines as comprehended by the originator of the style. In this discussion we will try to point out factors that we have developed down through the years that lead to decided improvements in operation and in the value of the results obtained.

First then, to those of you who use these tubbing machines, you should realize that you are in reality undertaking to finish metal products in a device that is neither more nor less than a miniature laundry wash wheel. In a laundry, we generally find a procedure somewhat as follows: The laundryman wisely knows his water condition so he first normalizes the water to zero hard, or soft. Various lots of laundry are enclosed in mesh bags and packed within the wash wheel and the water is added along with water softener and such other agents as are considered essential in obtaining penetration and wetting, as well as saponification, dispersion, defloculation, and detergency. The wheel is then closed and started in operation.

After a suitable interval in this first operation which is generally termed "sudsing," the water solution is drained from the barrel and the first rinse water is added. After a suitable interval, this is also drained from the barrel and a second rinse water is added, the latter often including what is termed a "sour" to neutralize any excess alkaline materials that might be present and that would cause staining in the ironing or pressing process. Thus, you will see a minimum of three water changes for each wash wheel of work.

Now go back to your December issue and reread all that we have said regarding the use of soap in the barrel finishing process, but remember this, that the laundryman in charging his barrel uses hot water whereas the average finishing department will use water at faucet temperature. It should be apparent to you that the laundryman's soap goes into solution very quickly, whereas most of you require from five to ten minutes for the formation of a satisfactory solution, during which time you are operating practically without lubrication which is not helpful in the carrying out of

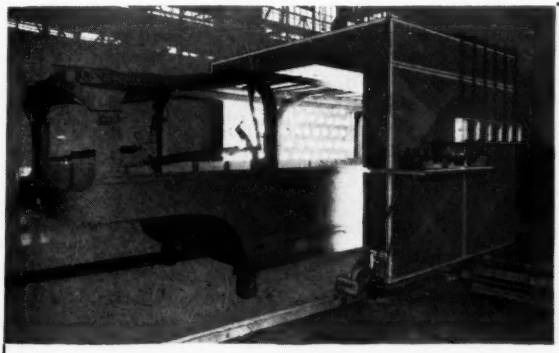
the burnishing process.

Is there a single one of you that changes the solution in the tub after each load of work is completed? What usually happens is this. You start with a clean solution which, after the first operated load might be said to be 90 per cent clean and 10 per cent contaminated. Then you proceed with load after load and with a continuing and progressive rate of contamination of the burnishing solution that may well proceed to ratios of 80 to 20, then 70 to 30, then 60 to 40, then 50 to 50, and so on. In other words, each load you operate is a solution just one degree more contaminated than the preceding load, and it must be inevitable that somewhere along this line of progressive contamination some violent reaction of some kind must take place and generally does. Unfortunately, our own brand of high school chemistry is just not enough to enable us to analyze all of the causes that might contribute to such a reaction, but that it does occur in fact might be explained by letters such as the following that we receive regularly:

> "We go along for a time and everything seems to be all right and then suddenly and without any apparent reason the parts come from the barrel covered with some sort of a dulling film that we find exceedingly hard to remove. We find this film or scum all over the work and the burnishing material as well as the cylinder and tub itself. What shall we do?"

Would it be surprising to you when we tell you that in larger part these letters are at least 90 per cent from tubbing machine operators? They are the exception coming from operators of barrels where the burnishing solution is renewed with each barrel load of work.

We have visited many plants where



● Power propelled Infra-Red oven installed at Whitehead & Kales Company, Detroit, Michigan. Used in baking paint on highway auto trailers. Oven travels over entire length of stationary trailer during baking process.

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this particular type of barrel is used and we have found that among other things acid bright dipping prior to barrel finishing is almost a regular practice, and what we see is the customary sulphuric-nitric-muriatic acid dip. A load of parts is placed in a dipping basket and is plunged into a crock, up from which comes a vicious black fog. The basket is then plunged into a rinse tank, sometimes in still and sometimes in running water, then into a second rinse and from this directly into the barrel. After this procedure, are you prepared to say definitely that all traces of acid have been removed from the parts? We think not, and so perhaps we had best take you on another brief little journey and this time to Asbury Park, N. J., the place being the Grand Ball Room of the Berkely-Cartaret Hotel and the occasion the June 20th, 1939 Session of the Twenty Seventh Annual Convention of the American Electroplaters' Society. A very interesting paper on the subject "Bright Dipping of Non-Ferrous Metals" had just been presented by our good friend Dr. Walter R. Meyer, and a discussion of the paper is under way. The question of the rinsing of a chromic acid bright dip was under way when there arose in his place in the meeting another good friend, Dr. Gustaf Soderberg, and this is what he said:

> "As far as the difficulties of rinsing of chromic acid are concerned, I wonder if it is not largely a matter of the intense color of chromic acid and that one can always see traces which are not removed. **When we use other bright dips, we just do not know when we have done a complete job of rinsing.**"

In these brief remarks, we are sure that Dr. Soderberg did not have barrel finishing in mind even in a most remote sense, and yet it seems to us that he has placed his finger precisely on one factor that causes the condition as outlined in the quoted letter. When a burnishing solution is used over and over again, as is the case in tubbing machines, and where bright dipping is a part of the finishing process, it must be inevitable that even small quantities of acid introduced into the solution will sooner or later neutralize the alkaline content, leaving only the grease base (whatever that may be) and that this might combine with calcium and magnesium to form films of insoluble soaps and to produce the identical situation as described.

We have only one remedy to offer and it is the same that has been found quite generally adequate. Simply plug up all the ingress and egress holes in the barrel. Operate your burnishing material, parts to be finished, soap and water all completely enclosed within the barrel itself. You will require normally just about one-half pint of water per charge along with a

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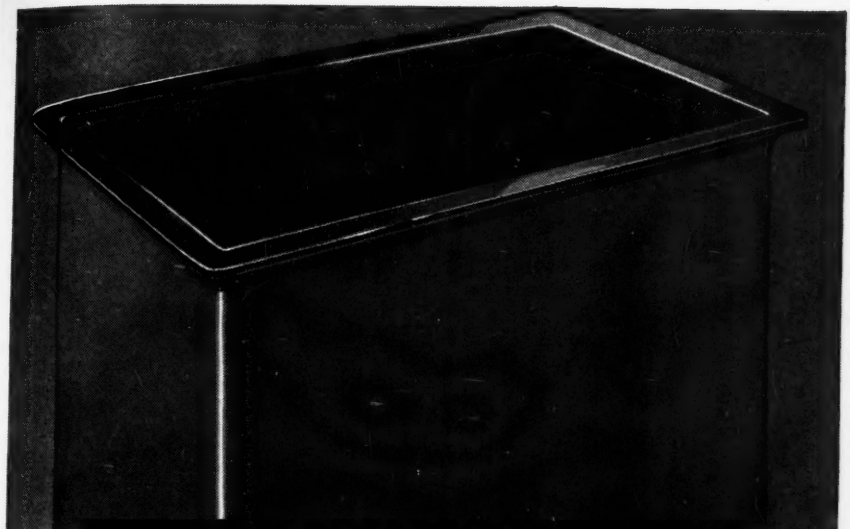

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Whether we supply plating tanks lined with GRS, Neoprene, or natural rubber, we use one rare extra ingredient—**CARE!** Extraordinary care. It is evident in every step of the job; in the preparation of the tank shell for the rubber-lining; in the careful application of cross-plied rubber sheets; in the precision control over every stage of the vulcanization process; and in the final inspection, so constantly rigorous that it prompted one new workman to mutter, "Hell, aren't you guys ever satisfied?"

Frankly, we never are, until we're absolutely sure that each "U. S." Paraply rubber-lined tank will do an even better job than our customer expects.

Of the hundreds of Paraply rubber-lined plating tanks we have installed during the last few years, just two have failed to measure up to this standard of service.

Can you ask for any better assurance of unqualified satisfaction?

OTHER "U. S." PRODUCTS FOR METAL FINISHERS

Tank Linings: Tygon - Resilon - Lead • Acid Brick and Tile • Chemical Stoneware Tanks, Pots, Jars • Tygon Corrosion-Resistant Plastic Paints • Tygon Tape • Tygon Rack Coatings • Tygon Stop-Offs and Masking Lacquers • Tygon Flexible Tubing • Ruscat Metal Cleaner • Lead Anodes • Dipping Baskets • Acid-Proof Floors.

Available through your local plating supply dealer, or write direct.

proportionate quantity of soap to produce a firm lather, and use the outer tub as a rinsing sink and nothing more. Thus, you will operate each load of work in a fresh charge of burnishing solution, and your difficulties, as the one quoted, will at least for the greater part disappear.

In regard to the closing of the holes in the barrel and operating it as a completely enclosed unit, those of you who have followed these discussions will recall our frequent mention of the Tahara Automatic Silver Burnishing Machine; that it embodies the very essence of the Uebersax conception of barrel finishing, and that it has for many years been a product of the American Laundry Machinery Company of Cincinnati, an organization with an international reputation for possessing an unusual degree of "know how" in the field of operation of laundry wash wheels.

Did you know that the barrel of this machine operates within an outer casing in much the same way as your tubbing machine? Does the American Laundry Machinery Company poke the barrel of the Tahara Machine full of holes and operate flat and hollow table silverware load after load in the same burnishing solution, each cycle more contaminated than the one before? We can give you the answer to that question and it is definitely and decisively NO.

And now we want to discuss with you electrodeposited coatings and their relation to pressure as developed in burnishing barrels. There should be no need for us to call in medical authorities to convince you that the skin on your body is full of pores and further than that, no electroplating authority to also convince you that all electrodeposited coatings are also full of pores. Tubbing machines are pretty

ONE SOLVENT

For all Metals or Combination of Metals

NEW SCIENTIFICALLY IMPROVED

BLACOSOLV

for SOLVENT VAPOR DEGREASERS

Write today for FREE BOOKLET ON Degreasers and application with Blacosolv.

G. S. BLAKESLEE & CO.

BLACOSOLV DEGREASERS AND SOLVENT

NIAGARA METAL PARTS WASHERS

G. S. BLAKESLEE CO., CHICAGO 50, ILLINOIS · New York, N. Y. · Toronto, Ont.

the power you want... when you want it!

to meet varying demands of plating and anodizing

G-E COPPER-OXIDE RECTIFIERS

offer quick power change-over . .

There's no need to be tied down by a fixed power supply. The flexibility of General Electric copper-oxide rectifiers offers you a wide choice of current and capacity to meet the requirements of various types of plating. You can easily install one or more G-E units without special foundations or expensive accessories. Others can be added as needed. With G-E rectifying equipment, you have "building block" changeability for series, parallel, series-parallel circuit arrangements.

Basically a step-down transformer and a rectifier, each self-contained G-E unit supplies smooth, steady d-c in blocks of 6 or 12 volts. Control is manual or automatic. With the automatic control, voltage is maintained at within plus or minus one per cent from no-load to full-load. Adjustment is controlled at a-c input for economy.

There are many G-E combinations designed and engineered to meet the most exacting plating and anodizing conditions. For information and illustrated booklet, write Section A30-268, Appliance and Merchandise Dept., General Electric Company, Bridgeport 2, Connecticut.

GENERAL ELECTRIC

much exclusively used by the jewelry field and more especially in that field where what is commonly termed costume jewelry is the principal product. The plate applied in this case is just as porous as the plate you will find in any other field of electroplating, only, if anything, thinner.

Did you ever watch a gold beater pounding away at his pad of goldbeaters skin, making layer after layer of thin gold sheets. While these sheets are thin, so thin in fact that when held to the light the gold itself becomes green instead of golden in color, they are still far heavier than most electrodeposited plate. Gold leaf is made by impact, that is, by successive strokes not precisely or evenly distributed, and the speed at which you operate your tubbing machine also produces a finish by impact and it, as well, is not evenly distributed.

We understand, of course, that these very small barrels cannot give you much by way of pressure developed within the mass, but we cannot understand, this being true, just why the greater part of the operators of these small low pressure barrels insist on using round balls only in their operation. They refuse to recognize that a round ball offers the least resistance of any body used in mechanics and that something better is almost immediately available. For the type of work you are doing, we could recommend nothing better than diagonal polishing steels, sometimes termed slugs, and in equal proportions of the sizes 3/32 and 1/8 inch. This material averages just 12½ pounds to each quart of bulk so that it will be comparatively simple for you to determine the quantity you need.

Now take just one of your barrels, determine the quantity required to fill it at least ½ full of the burnishing material, to which you can then add parts to bring the load to 2/3 full. If you are operating at 45 to 50 r.p.m., try, if possible, to slow down the barrel speed to somewhere between 28 and 35 r.p.m., for with the interlocking tendency of diagonals and their greater resistance in the mass to the parts passing through the mass, high barrel speeds are necessary or essential.

On this one barrel, plug up the openings, as we have suggested, and keep the burnishing materials, the parts to be finished, and the soap solution all within the barrel, but don't have water in the tub. When the load is completed, simply rinse out the soap solution, using the tub section as a rinsing sink.

You understand, of course, that we are not asking you to discard your machine, but only that you operate it to your own best advantage. If your tubs are small,, then as they wear out and are ready to be discarded see whether it isn't possible to secure a larger one that will operate with the same driving mechanism, and with the larger barrels remember to reduce the

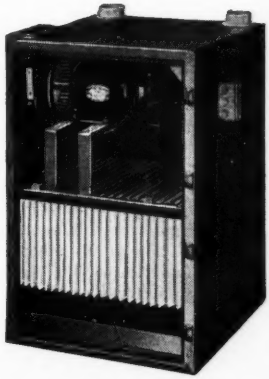
Get . . FLAWLESS
FINISHING RESULTS
PREPARE THE SURFACE
with
Crystal
TACK RAG
TACK OFF THOSE SPECKS
Speed Up Your FINISHING PRODUCTION LINE with this Soft Tacky Cloth
IBCP
TACKY WIPERS
Available in GROSS LOTS thru PAINT DEALERS or from the Processor
Industrial Size 18 x 36
Spontaneous Combustion Proof
Exclusively Processed by
BAUGHN CHEMICAL PRODUCTS CO.
1203 West Chicago Avenue . . Chicago 22, U. S. A.

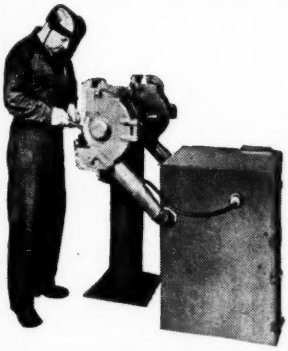
In factories, as well as homes, the dust problem is serious. Stop dust at its source with:

TORIT DUST COLLECTORS

Collect dust right at the machine with TORIT Dust Collectors. Self-contained units, they eliminate extensive piping, and cut operating costs. Cleaned air is recirculated into the room.

Completely portable, TORIT Dust Collectors fit into all production layouts, and may be moved as necessary. Sizes range from ⅓ HP to 3 HP, with connections designed to fit all standard machines.





For details and latest TORIT catalog write:

TORIT MANUFACTURING CO.
314 Walnut Street St. Paul 2, Minn.

speed. True, the load will be greater but remember too that distortion and deformation of parts in process are seldom caused by excessive load, but almost invariably by excessive barrel speeds. With the heavier loads of burnishing materials, there will be a difference in surface finish since the finish will be obtained by a constantly maintained pressure within the mass itself as distinguished from the sort of finish you are now getting with inadequate loads and high speeds and by impact or hammering in the process of which we aren't quite sure but that you at least hammer off some of the plate you originally deposited.

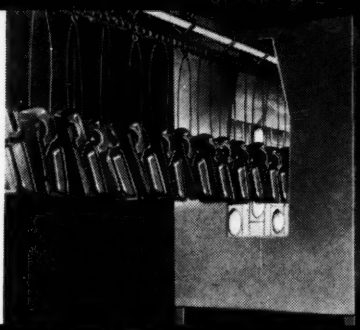
If you operate in clean solutions for each load, the possibilities of lime and magnesium film formations will be lessened or eliminated. You cannot deposit plate on these films and expect it to stick and stay stuck, nor can you obtain desirable surfaces when lime films are present. In addition, lacquers do not lend themselves to adhesion to an insoluble soap film that may be on your parts.

Confidentially, of course, we believe that if we made a search around this house, it would not be too difficult to unearth at least half of an ordinary cigar box full of so-called costume jewelry, some cheap, some medium, and some comparatively high priced. However, on examination, each and every piece would bear on its face the one word—failure. This should not be so, and we have the feeling that a large part of the responsibility for such failure could be found somewhere in the immediate vicinity of where the barrel finishing operations are being carried on, and possibly part of it on operations before plating and some on operations after plating.

When and if you make the change-over as suggested and before you put it into operation, just drop in at the stationery counter of your local 5 and

Here's Proof Jensen Dual heat Infra-Red Does the Job Faster, Better

This Jensen installation at Richmond Mfg. Company was designed to bake "fire engine red" paint on toys in 8 minutes. But the oven does the job in 4½ minutes! Reason: Jensen "dual-heat" *combines* radiant energy heat with convection heat . . . gives *more heat in less time!* Moreover, parts come thru with no discoloration. Reason: Jensen's exclusive "nesting" arrangement of lamps *distributes heat evenly* . . . positively eliminates danger of overbaking certain areas and underbaking others! Write Jensen today!



JENSEN SPECIALTIES, Inc. JENSEN 9331 FREELAND DETROIT 27, MICH.

DESIGNERS and BUILDERS of "DUAL HEAT" INFRA-RED OVENS • CONVEYORS • PAINT DIP TANKS

"PACKAGE" your product to *Sell*

with one coat of

M&W's gleaming METALUSTRE

Slip your product into a shimmering coat of Metalustre and put yourself a step ahead of the field in getting people to take what you make. Available in practically every color, as either a lacquer or synthetic finish to meet individual production requirements, Metalustre contains metallic powder . . . air-dries quickly or bakes to a lustrous metallic finish that really gleams and "sells" . . . and with just a one-coat application.

What's more, Metalustre is a durable, tough finish that resists perspiration, outdoor elements. Its combination of good adhesion plus flexibility prevents chipping or peeling when objects finished with Metalustre are dented or bent. Metalustre may be used on most metals, wood or plastic with either the spray or dip method. Write today for Technical Data Bulletin 102 and the Metalustre color card.

PIONEERS IN PROTECTION

M.&W.Co. 1876

. . . where industry goes with finishing problems

MAAS & WALDSTEIN COMPANY NEWARK 4, NEW JERSEY

1658 Carroll Avenue, Chicago 12 • 6 Jersey Street, Boston 15 • 10751 Venice Boulevard, Los Angeles 34

PRODUCERS OF LACQUERS, ENAMELS, SYNTHETICS AND SPECIALIZED PRODUCTION FINISHES

10c store and buy each worker in the department a small 25c magnifying glass. Let them compare the work developed from the use of round balls in a high speed barrel with the same parts when operated with diagonals in a slower barrel. We are sure that both you and they will be surprised and satisfied with the results. We have privately made this identical suggestion many times and in no case have we ever known of anyone going back to the round-ball-high-speed method.

In one plant where it has been our very great pleasure to act as barrel finishing consultant for many years, the change-over as suggested resulted in an increased production ratio of as 6 is to 4. In other words, they are now turning out six loads of finished work in closed barrels with diagonals and with an even better finish than they had previously obtained on four barrels of work with round balls in the same period of operating time. This means no less than an increase in production volume at a decrease in production cost.

"Duridine—The Modern Metal Cleaner and Conditioner" is the title of a four-page illustrated circular published by the American Chemical Paint Co., Ambler, Pa. Information on the application of Duridine to metal products, as well as a partial list of ACP products, is included. Copy of Technical Service Data Sheet No. 3-2-210 free upon request.

Hammond Polishing Machinery. A 20-page catalog containing illustrations, descriptions, and specifications of its complete line of polishing and buffing machinery, including single and variable speed polishing lathes, abrasive belt, automatic and cylindrical finishing machines, has been prepared by Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo 54, Mich. Copy of Catalog No. 55 free upon request.

LATHES
at long last!
Buffing and Polishing Lathes in Stock

We have a very fair assortment of polishing and buffing lathes on hand, comprising —

Motor driven Bench Lathes • Belt driven Floor Lathes
Motor driven Floor Lathes

No great quantity of anything, but a good variety of horse powers and speeds.

Tell us what you need and we probably are in a position to offer something which would meet your requirements.

MUNNING & MUNNING, Inc.

Designers Engineers Manufacturers

***Main Office and Plant:* 202-208 Emmet St.**

New York Philadelphia Woonsocket, R. I.

Iridite Offers a Fast, Sure Way to Lick Corrosion in Zinc, Cadmium, Galvanizing!

From every angle . . . Iridite gives you an anti-corrosion agent that will boost sales appeal and profits in your zinc, cadmium and galvanized products. *It's this simple:* Immerse your parts manually or automatically—in single racks or bulk—for only 15 to 60 seconds—in an Iridite solution. Iridite does the rest—while maintaining automatic machine cycles—and dries in a few seconds for immediate handling, packing and shipping.

Use Iridite as a final protective finish . . . as a paint base for permanent adhesion . . . as a cost-cutter in combination with galvanizing or zinc plate to replace more expensive materials. Iridite *unites chemically* with the metal . . . won't chip, flake or peel . . . won't alter dimensions.

Currently available in eye-appealing red, green, blue, bronze, olive drab, black and transparent Iridite-Bright. Check Iridite's performance for yourself. Send for free test panel . . . half Iridited, half unprotected. Rheem Research Products, Inc., 1493 Standard Oil Building, St. Paul and Franklin Streets, Baltimore 2, Maryland.

BRANCHES—MacDermid, Inc., Waterbury 88, Conn.; Mitchell Bradford Chemical Co., Bridgeport, Conn.; J. C. Baker, 2162 West 93rd Street, Cleveland, Ohio; J. C. Miller Company, Grand Rapids 4, Mich.; Wagner Brothers, Detroit 3, Mich.; Rheem Research Products, Inc., 20 E. Jackson Blvd., Chicago, Illinois.

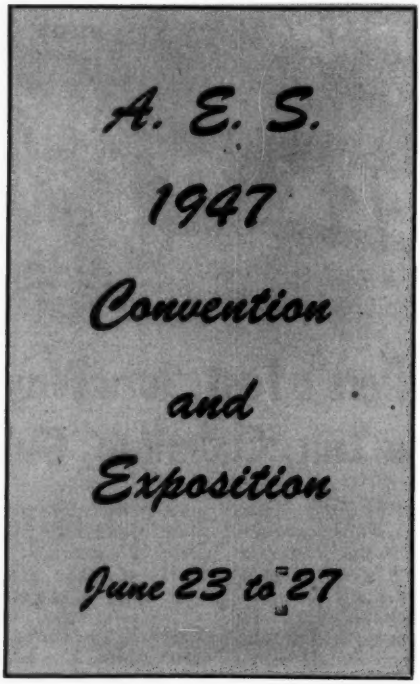
Reg. U. S. Pat. Off.

RHEEM RESEARCH PRODUCTS, INC.

IRIDITE

Standard Oil Bldg., Baltimore 2, Md.

DETROIT, Mich., great industrial center and plating headquarters of the world, will be host in June to the American Electroplaters' Society Convention, the main feature of which will be an Industrial Finishing Exposition. This Exposition should be of prime importance to all connected with the finishing of metals. Suppliers to the industry and manufacturers of plated articles alike are invited to participate in a panorama of metal finishing progress by exhibiting products in the Exposition.



Public to Be Invited

The public will be encouraged to attend the Exposition so that the full story of electroplating can be explained to as many as possible. The average man, who uses many plated articles constantly, must be shown how plating beautifies and protects, what part plating plays in his daily life, how carefully plating operations are conducted to obtain proper results, and what he gets when he buys a plated part.

Plant Executives Will Attend

Suppliers will meet the largest number of factory executives ever assembled under one roof at one time in the electroplating industry. For a period of five days — afternoons and evenings—they will have the opportunity to explain their sales story to men with authority to specify and buy. These men, from all parts of the country, will attend the Exposition in search of machinery, processes, materials, and services applicable to their manufacturing operations.

Large Attendance Assured

A large attendance is assured. Through the medium of national trade journal, newspaper and radio advertising and publicity, the Industrial Finishing Exposition will be called to the attention of millions. You are invited to take your place among the leaders in the metal finishing industry by reserving space in the Industrial Finishing Exposition.

* * *

Proceeds From Exposition to Revert to American Electroplaters' Society Treasury

The Industrial Finishing Exposition is sponsored by the American Electroplaters' Society and is a part of the Society Convention. All matters pertaining to the Exposition are handled by Society members whose services are rendered gratis. Net proceeds derived from the Exposition will revert to the Society treasury and will be used for research and educational purposes.

ANOTHER OUTSTANDING DSM INSTALLATION

DSM CROSS FLOW CIRCULATION *FOR ACTUAL SURFACE CONTACT*

Properly applied, DSM designed CROSS FLOW heating systems effects a gentle wiping action on all surfaces—sides—tops—bottoms—of your product, to be dried or processed. Resulting in speedier baking and a more uniform product.

Drying from center outwards avoids case hardening

WE WANT TO BUILD ***YOUR*** *OVENS*

PLANT ENGINEERING: *Consulting assistance in plant layout to coordinate departmental operations, our experience dated from 1917 in this field.*

Such plant layout may be based on increasing production beyond present capacity, or it may be a rearrangement in this post-war period when operations are conducted under a new set of conditions.

MOTOR CLEANING EQUIPMENT: *Washing machines for cleaning tear-downs. Kerosene spray or similar solvent usually used as the cleaning medium.*

FORMED COWLINGS, PANELS, ETC.: *To your specifications, and of light metal alloys as required. Weldments and brazed assemblies may be under controlled atmosphere.*

PILOT EQUIPMENT: *Sample size equipment for development of heavy equipment.*

VERTICAL CORE BAKING OVENS CONTINUOUS HORIZONTAL BAKING OVENS • BATCH TYPE CABINET OVENS DRAWER OVENS

DETROIT SHEET METAL WORKS
1303 OAKMAN BLVD.
DETROIT 6, MICHIGAN

METAL FINISHING EQUIPMENT *by*
DETROIT SHEET METAL WORKS
1303 Oakman Boulevard DETROIT 6 MICHIGAN

DSM INDUSTRIAL OVEN
DESIGNED AND BUILT BY DETROIT SHEET METAL WORKS

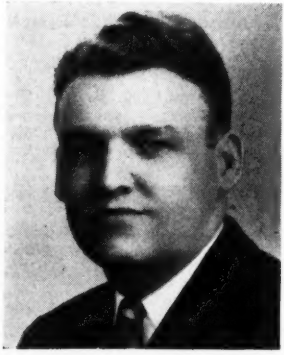
PAINT SPRAY, HEATING, VENTILATING, COOLING, DRYING, HUMIDIFYING SYSTEMS, JAPANNING AND INDUSTRIAL OVENS, INDUSTRIAL WASHING MACHINES

NEWS of the Industry

Wyandotte Chemicals Additions

Charles M. Chalfont and John E. McCarthy are recent additions to the Industrial Department Service staff of Wyandotte Chemicals Corporation. Both men were given practical training courses in several Wyandotte territories before being given their Ohio assignments—Mr. Chalfont to Dayton and Mr. McCarthy to Columbus.

For 13 years Mr. Chalfont was a member of the laboratory staff of the Copperweld Steel Company, and for the past four years was the Detroit service representative of G. Whitfield Richards, manufacturer of cutting, drawing, and grinding lubricants. His chemical and metallurgical studies at Carnegie Tech and the University of Pittsburgh and his memberships in the American Society of Metals and Society of Lubrication Engineers will be of practical value to Mr. Chalfont in his Wyandotte service work. He will assist Tom McHugh, veteran Wyandotte man, who is well known in the Southern Ohio metal-finishing industry.



Charles M. Chalfont

Mr. McCarthy is a resident of Columbus and attended the Ohio State University. For four years he was head of the Engineering Materials Laboratory of Curtiss-Wright Corporation and directed the activities of the chemical, metallurgical, and physical sections. His previous experience plus his "refresher" training makes him well fitted for servicing Wyandotte products in the metal-finishing industry. He will operate under the direction of the Cleveland office of Wyandotte Chemicals where Earle J. Esner is the Industrial Department representative.

John E. McCarthy

Interchemical Finishes Honors Service League

At dinners held recently in Cincinnati, Chicago, and Newark, the Interchemical Corporation, Finishes Division honored members of its Service League which

JUST THE SAME!

The International Nickel Company of Canada, Limited beats tough corrosion condition

This 554-foot chimney was built* in 1936 for International Nickel of Canada to handle gases from copper reverberatories and converters. Now, after ten tough years, the smoke goes up this chimney just the same as the day the stack was built!

TEN YEARS WITHOUT REPAIR

The gases contain SO_2 with moisture content slightly above atmospheric humidity. Despite this corrosive condition, up to the present time no repairs have been made to this stack, and no evidence of deterioration has been noticed.

HERE'S WHY:

The entire lining of this stack was built with acid-proof brick laid in Penchlor Acid-Proof Cement.** In addition, the top fifty feet of this stack was further protected by using Penchlor Acid-Proof Cement for pointing the outside surface joints. Penchlor Acid-Proof Cement is a superior sodium silicate cement that is quick-setting and self-hardening. Its outstanding record of satisfactory service has been proved in chemical plants, steel mills, paper and pulp mills, oil refineries and smelting plants.

SEND FOR CASE REPORT

If you have a corrosion problem, you'll be interested in further details about this Penchlor installation, as well as an illustrated brochure on Penchlor. Write for Case Report Number 65-2.

Special Chemicals Division

PENNSYLVANIA SALT MANUFACTURING COMPANY

1000 Widener Building, Philadelphia 7, Pa.

New York · Chicago · St. Louis · Pittsburgh · Cincinnati · Wyandotte

Tacoma · Portland, Ore.

*Built by Custodis Canadian Chimney Co., Ltd., Montreal

**Penchlor Acid-Proof Cement was furnished by our Canadian Associates, G. F. Sterne & Sons, Ltd., Brantford, Ontario

PENN SALT

CHEMICALS

97 Years' Service to Industry

CERTIFICATE OF
Recognition
INTERCHEMICAL CORPORATION
Finishes Division Service League
John A. Doe
1920 - 1946
FAITHFUL AND CONTINUED SERVICE TO ONE ORGANIZATION IS A CREDIT BOTH TO THE COMPANY AND THE EMPLOYEE AND WARRANTS OFFICIAL ACKNOWLEDGMENT. IT IS, THEREFORE, MY PLEASURE AND MY HONOR TO PRESENT TO YOU THIS CERTIFICATE OF RECOGNITION AS EVIDENCE OF MY PERSONAL APPRECIATION OF YOUR CONTRIBUTION TO OUR SUCCESS.

Type of certificate presented to honored members of Interchemical Finishes Service League. Inset shows lapel buttons also presented.

comprises employees with five or more years of service. Gold lapel buttons studded with diamonds were presented to eight employees who have been with the company 40 years or more. These include Charles J. Roh, Aymer J. Bucher, Lewis B. Vreeland, Daniel T. Daley, and William C. Schuster of Newark; and William F. Obrien, Harry K. Carnay, and Joseph Hurst of Cincinnati.

Other types of lapel buttons and certificates designating their years of service were presented to 367 employees whose combined service record with the company totals more than 6,000 years.

New Enlarged Plant for Optimus Companies

The Optimus Equipment Company, engineer and manufacturer of metal washing and drying equipment, and the Optimus Detergents Company, manufacturer of industrial cleaning materials, are occupying their new enlarged plant at Matawan, N. J. Since their inception 2 years ago, both companies have been located in the plant of the Hanson-Van Winkle-Munning Company. Recently, the buildings of the former Matawan Tile Company have been purchased for the purpose of providing the two Optimus firms with increased space and manufacturing facilities.

With the new plant in operation, improved streamline production layouts for the manufacture of Optimus equipment, including a new line of metal degreasers, have been made possible. The entire manufacturing facilities of Optimus Detergents will be housed in a separate building in the new plant, which consists of a total of 11 buildings, 6 of which will be utilized by the Optimus activities, with the balance to be occupied to a large extent by the parent organization, Hanson-Van Winkle-Munning Co.

All office, sales, laboratory, design and manufacturing personnel will be located at the new plant, which will be under the direction of Allen T. Baldwin, general manager of the two Optimus companies.

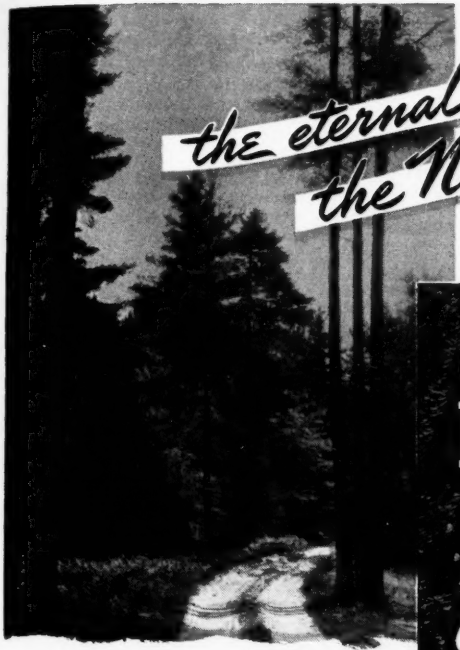
Gray Joins Pennsalt Advertising Department

Bryce Gray, former first lieutenant in the United States Army Air Force, has joined the Advertising Department of the Pennsylvannia Salt Manufacturing Company. Mr. Gray, former city clerk of the Borough of Longport, N. J., is a graduate of Rutgers University and the Perkiomen Preparatory School.

M & W Awards New Membership in 25-Year Club

At the company's annual Christmas party, Dr. G. Klinkenstein, vice president of the Maas & Waldstein Co., Newark, N. J., announced that another employee had achieved membership in the 25-Year Club. Victor Galgani, of the enamel department, was presented with a 25-year gold service pin and a gold watch.

The 25-Year Club membership now totals 23, four of these members having earned a place in the 50-Year Club.



the eternal beauty of the North Woods

is captured in PINE TREE Wrinkle

One of the many controlled textures available to users of versatile Wrinkle coatings.

PINE TREE WRINKLE patterns . . . small, medium or large—in your choice of color or color combinations . . . will help sell YOUR products. Add to this sales appeal the unmatched economy of Wrinkle application and you have two of the reasons why thousands of manufacturers standardize on Wrinkle protective and decorative industrial finishes. Pine Tree texture is especially adapted for caskets, larger cabinets, machine tools, etc.

Write *for our bi-monthly publication "New Wrinkles in Finishing." It's free, it illustrates a variety of interesting Wrinkle applications; and it lists the nearly 200 licensed suppliers of Wrinkle coatings.*

New Wrinkle, Inc.,

Wrinkle
REG. U.S. PAT. OFF.

OFFICE AND RESEARCH LABORATORIES
1765 Springfield St., Dayton 3, Ohio

ANY INDUSTRIAL FINISH MANUFACTURER WHO MAINTAINS OUR STANDARDS MAY SECURE A WRINKLE LICENSE.

***WRINKLE*—the one-coat finish for metal sheets, castings, weldments. It conceals defects.**
***FLEXIBLE WRINKLE* for coating fabrics, paper, paper-board, plastics and artificial leathers.**

Elected to Board of Directors

The Baughn Chemical Products Company, Inc., processor of Crystal Tack Rags, announces the election of Thomas M. Lyman to the board of directors and as secretary-treasurer of the company. Recently released from the Army after more than 5 years of service, Mr. Lyman

Thomas M. Lyman

is a graduate of the University of Illinois and was formerly connected with the Chicago office of S. D. Leidesdorf & Company, certified public accountants. At the time of his induction in June 1941, he was with McKesson & Robbins, Inc., New York.

Opens Portland Sales Office

The opening of a new general district sales office at 6400 N. W. Front St., Portland, Ore., is announced by the Pennsylvania Salt Manufacturing Company of Washington. The office, located at the company's Portland chemical manufacturing plant, is handling Pennsalt's line of chemicals for industry, chemical specialties, and agricultural chemicals.

LeRoy M. Shaneman, who has been connected with the Tacoma office since completing Navy duty during the war, has been appointed district sales manager in charge of the new office. The Pennsylvania Salt Manufacturing Company of Washington is a subsidiary of the Pensylvania Salt Manufacturing Company of Philadelphia.

Udylite Named Distributor for E. P.

Gordon J. Berry, vice president of The Electric Products Co., Cleveland, Ohio, announces that effective December 1, 1946, The Udylite Corporation of Detroit has been appointed distributor of E. P. electrolytic motor generators.

Udylite, with its nation-wide organization of sales representatives throughout the industrial centers of the country, is in constant contact with all elements of the plating and finishing industry.

Retires as Vice Chairman of Board of Directors

The retirement of Robert L. Clause as vice chairman of the board of directors of the Pittsburgh Plate Glass Company, effective February 1, is announced by Harry B. Higgins, president of the firm. Mr. Clause has served in that capacity since 1944 and, prior to his election to the vice chairmanship, served as president of the firm for a three-year period.

Joining the company in 1914 upon his

Robert L. Clause

graduation from Cornell University, Mr. Clause has been associated with the Pittsburgh Plate Glass Company for more than 32 years. Starting with the concern as a draftsman, he successively held the positions of general superintendent of plate glass manufacturing, director, vice president, and executive vice president prior to his election to presidency of the firm in 1941.

Dependable Convenient
DC-POWER
FOR YOUR PLATING ROOM

. . . with FEDERAL
RECTIFIER EQUIPMENT

Wherever D-C power is needed in the plating room, Federal Electro-plating Rectifier Equipment provides a power source that is always dependable — always convenient to operate.

Powered by
Federal's Selenium Rectifiers

The Federal heavy-duty Selenium Rectifier, with Center-Contact Construction, is the most dependable and trouble-free rectifying unit available today. Because it is instant starting, d-c power is available immediately at the flip of a switch. This means big savings in operating time, and in power consumption too.

AVAILABLE NOW— in sizes from 500 to 50,000 amperes 6 to 48 volts!

Write today to Dept. E633 for complete information.

Installation of FTR 4222-AS Rectifier Equipment, delivering 1000 amperes 6 volt per unit to an automatic electroplating unit.

FEATURES

- Long Life
- Instant Starting
- Low Operating Costs
- Flexibility of ratings
- Quiet operation

Federal Telephone and Radio Corporation

In Canada:—Federal Electric Manufacturing Company, Ltd., Montreal
Export Distributor.—International Standard Electric Corporation, 67 Broad St., N. Y. C.

Newark 1, New Jersey

Burdett Doubles Production Capacity

As a result of sharply increased sales of infra-red gas burners, the Burdett Manufacturing Company has moved to new and larger quarters at 3433 W. Madison St., Chicago, Illinois.

According to company officials, the recently doubled production capacity is the first phase of a board development program to include extensive research on new and improved applications of infra-red gas heat, as well as fundamental research on the basic infra-red principle. Additions to the engineering staff have already been made, and further announcements are expected in the near future.

Tenney Appointed Technical Representative

Dr. A. H. Tenney has recently returned to the New York offices of the Carbide and Carbon Chemicals Corporation as a technical representative for the Fine Chemicals Division. He will specialize in the establishment of markets for new

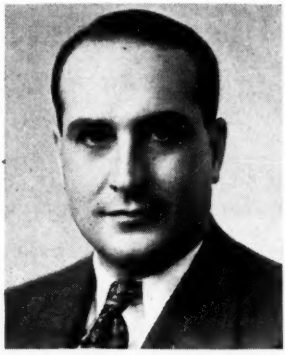
Dr. A. H. Tenney

chemicals being developed by the research laboratories.

Dr. Tenney recently completed 3½ years with the Manhattan Project at Oak Ridge, Tennessee, and was previously associated with the Carbide and Carbon Chemicals Corporation in a sales development capacity.

United Chromium Appoints Cleveland Representative

Curtis G. Miller has been appointed sales and technical representative for the Cleveland area by United Chromium, Incorporated. Mr. Miller, who served as technical officer with the Army Chemical Services, was formerly connected with the Chromium Corporation of America and the McGean Chemical Company. His



Curtis G. Miller

appointment brings a highly qualified technical adviser to United Chromium customers in Cleveland and its surroundings.

Mr. Miller will make available to this area all of the Unichrome processes and materials, which include plating processes, materials for the plating plant, synthetic coatings for product finishing, and the latest developments in industrial protective coatings.

Interchemical Realigns Pacific Coast Divisions

In order to consolidate its Pacific Coast operations, the Interchemical Corporation has tranferred the business of Scriver & Quinn, Inc., a West Coast subsidiary, to two other divisions. Industrial finishes formerly sold by Scriver & Quinn will be sold by Interchemical's Finishes Division, and Scriver & Quinn consumer products will be marketed by Interchemical Corporation—Scriver & Quinn Finishes.

SOL-KLEAN

Phosphoric Acid Metal Conditioner

Prepares Metal For Painting

- *CLEANS METAL — Removes oil, rust and corrosive agents.*
- *BONDS PAINT — Etches metal and coats with phosphate.*
- *SAFE — Non-inflammable, non-toxic, non-corrosive.*
- *EASILY USED — Adaptable to your plant's facilities.*
- *APPROVED—Wide usage for many years.*
- *MEETS GOVERNMENT SPECIFICATIONS*

INDUSTRIAL CHEMICAL PRODUCTS CO.

3775 Bellevue Ave.

DETROIT 7, MICHIGAN

Director of Industrial Relations for Pittsburgh Plate

The appointment of Samuel L. H. Burk as director of industrial relations for the Pittsburgh Plate Glass Company has been announced by Harry B. Higgins, president of the firm. Associated with the Atlantic Refining Company for the past 12 years, Mr. Burk served with the concern as director of organizations and methods in which position he was in charge of industrial engineering, office methods, organization and policy, and job evaluation programs.

During the war years, Mr. Burk was given leave by the firm to serve in consultant and executive capacities with the three war emergency agencies; namely, the War Production Board, Training Within Industry Division, and the Industrial Personnel Division of the Army Service Forces. A graduate of the Wharton School, University of Pennyslvania, and author of numerous papers on personnel administration and related subjects, Mr. Burk, in his new position with Pittsburgh Plate, succeeds Erson V. Ogg who recently resigned from the company to serve as a private engineering consultant to industry.

Samuel L. H. Burk

Elects New Officers

D. R. Goldwaite, chairman of the board of the Interchemical Corporation, announces that Ernest W. Pittman has been elected to the newly created office of chairman of the executive committee. Mr. Pittman has served as president of the corporation since 1937.

At the same meeting, Herbert B. Woodman was elected president. Mr. Woodman, formerly associated with the law firm of Cravath, Swaine & Moore, joined the Interchemical organization in 1936 and became vice president and secretary the following year. Mr. Pittman will continue to be fully active in the management of the corporation.

Basil Howell Appointed Production Superintendent

The Jones-Dabney Company announces the appointment of Basil Howell as production superintendent of its Automotive Division, located at Caniff & G.T.R.R., Detroit. Mr. Howell is well known in automotive paint production circles in the Detroit area, having spent 20 years with another large producer.

The Jones-Dabney Company manufactures and develops all types of automotive finishes in its Detroit plant.

Sales Representative on Pigment Colors

The appointment of John H. McMillan as sales representative on pigment colors for the southeastern coastal states and part of Philadelphia is announced by the Pigments Department of the Du Pont Compay. The company also announces that Don C. Booth will represent Du-Pont on white pigments only in the same territory. Previously, Mr. Booth was representative for pigment colors as well.

Mr. McMillan has been stationed at the Du Pont pigments plant in Newark, N. J., since 1935 and has worked as a research chemist on dry colors since 1943.

For a real good polishing job use

Keystone TURKISH Emery

FRESH SUPPLY AVAILABLE

KEYSTONE EMERY MILLS *Write for Sample* **4316 Paul St., Phila., Pa.**

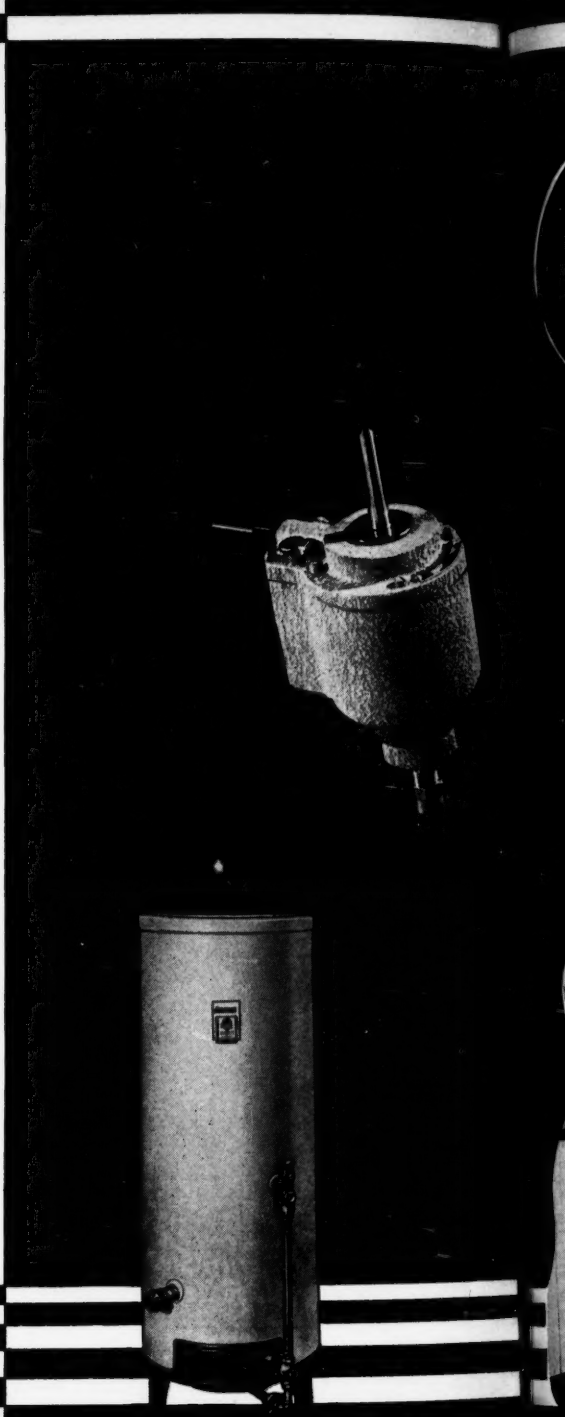
You can cut costs without cutting corners, with Pratt & Lambert Industrial Finishes.

PRATT & LAMBERT-INC.
Industrial Finishes
NEW YORK BUFFALO CHICAGO
FORT ERIE, ONT.

finishes

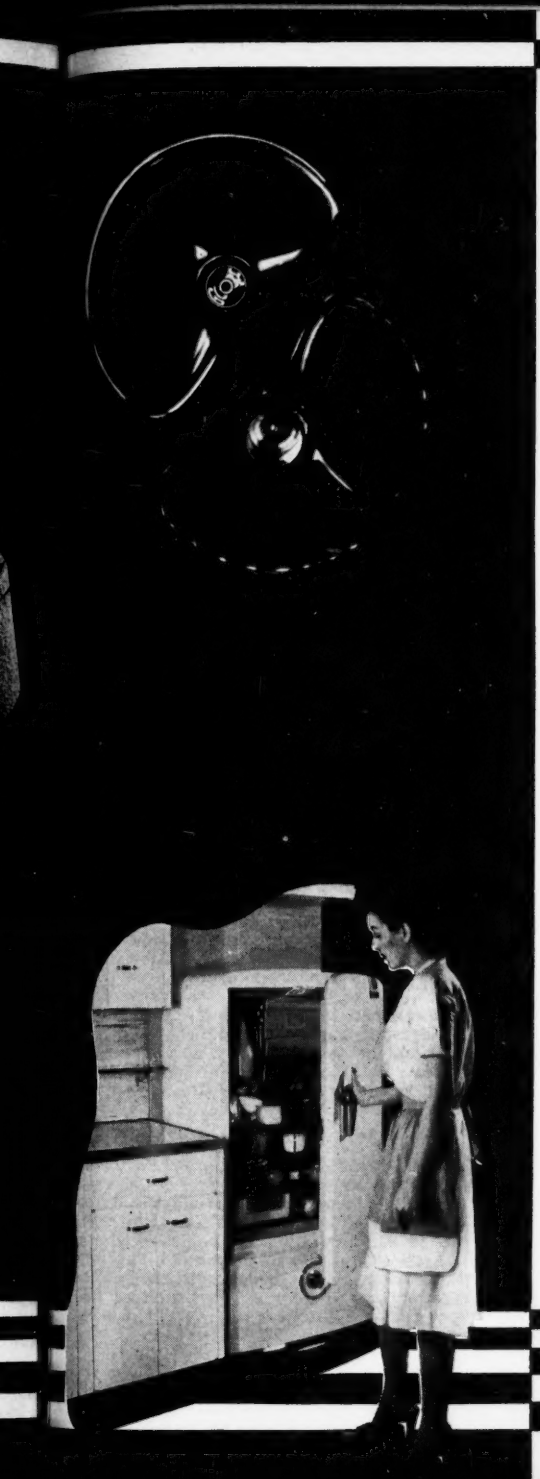
Made of aluminum, this drill press tapping head, after first cleaning in a washing thinner, is sprayed with Barret Varnish Company gray synthetic enamel which is infra-red baked to produce a wrinkle appearance.

(Photo courtesy R. G. Haskins Co., Chicago 12, Ill.)



Clean, noiseless, and occupying a small amount of space, this gas-fired automatic storage water heater for basement, utility room, laundry, or kitchen installation features a steel jacket with smooth white baked enamel finish and black trim.

(Photo courtesy American Radiator & Standard Sanitary Corp., Pittsburgh 30, Pa.)



By dipping lightweight aluminum castings in Tenite II Gel Lacquers, airplane control wheels are provided with an attractive dark red finish which is smooth and pleasant to handle, extremely tough, chip-proof, and easily applied.

(Photo courtesy Tennessee Eastman Corp., New York 16, N. Y.)

The Frigidaire Deluxe DI-7 Refrigerator features an all porcelain-on-steel interior with acid-resisting porcelain floor, and a baked-on Dulux exterior.

(Photo courtesy Frigidaire Div., General Motors Corp., Dayton 1, Ohio)

New Equipment and Materials

Hammond Model VROL Variable Speed Polishing and Buffing Lathe

Suitable for color buffing, light-cut buffing and polishing, a variable speed polishing and buffing lathe designated as the Model VROL is announced by Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo 54, Mich. A spindle overhang of 8 inches allows for the handling of bulky parts without base interference.

Hammond Model VROL Variable Speed Polishing and Buffing Lathe

Spindle speeds can be instantly changed while the lathe is in operation by turning a dial which raises or lowers the motor and causes the movable disc on the variable speed motor pulley to slide laterally, thereby increasing or decreasing its pitch diameter and changing the spindle speed. A single wide type V-belt is used for the drive from the motor to the spindle. Belt tension is automatically controlled by the motor pulley.

Standard equipment of the Hammond Model VROL Polishing and Buffing Lathe includes a variable speed drive with 3 h.p., 1,750 r.p.m., 60-cycle, ball bearing, general-purpose motor providing spindle speeds of from 1,500 to 3,000 r.p.m. or, if for 50-cycle current, spindle speeds of from 1,250 to 2,500 r.p.m. Additional features include a magnetic control with overload and low-voltage protection; push-button station; and combination brake and switch with spindle lock. Both ends of the spindle are tapped for taper points. Spindles of special length or diameter or having other than standard width between flanges can be supplied on order.

Specifications of the Hammond Model VROL Buffing and Polishing Lathe are as follows: horsepower, 3; standard arbor size, 1 or 1¼ inches; width between flanges, 3 inches; overall length of spindle, 47½ inches; distance between wheels, 37 inches; number of bearings on spindle, 2; floor to center of spindle, 38 inches; size of base at floor, 27 x 24 inches; floor space, 48 x 34 inches; net weight, 660 lb.; and shipping weight, 750 pounds.

Rice for the mouths of China!

BLACK MAGIC IN THE ORIENT

炊米得福

This is a steel rice bowl destined for shipment to China in great quantities. To secure good corrosion resistance and a pleasing appearance at an affordable cost, the manufacturer gives them a BLACK-MAGIC (black oxide) finish, plus a "Witch-Oil" Final Finish.

This is but one of thousands of applications for BLACK-MAGIC. BLACK-MAGIC is more than a "blackener." It is an *integral* finish that penetrates to .0001". It is very flexible—forming may follow processing—often a big saving. It is also an excellent paint and lacquer bond. Chemical reaction takes place at 300° F. For all steels except stainless.

There are also BLACK-MAGIC baths for zinc, copper, brass and cadmium. Send for samples and the "Black Book."

SILCO **A Glass-Base Spray Coat** **WRITE FOR DETAILS**

MITCHELL-BRADFORD CHEMICAL COMPANY
MODERN METAL FINISHES
• 2446D MAIN ST., (Stratford) BRIDGEPORT, CONN. •
CHICAGO OFFICE: 111 W. Jackson Blvd.

BLACK-MAGIC OXIDE BLACKING SALTS
WITCH-DIP & WITCH-OIL FINAL FINISHES

SILCO Glass-Base PROTECTIVE COATING
HEAT TREATING SALTS. CLEANERS. ETC.

N. Y. CITY: Lacquer Finishing Co., Inc., Clifton, N. J.—C. D. Hamilton, Fayetteville, N. Y.
CLEVELAND: Universal Paint & Varnish Co. — PHILA.: Albert Printz, Germantown
ST. LOUIS: G. S. Robins & Co. — DALLAS, TEX.: Texokana Supply Co.
LOS ANGELES: Barber-Webb Co. — OAKLAND: Geo. A. Kushman Co.

L&N "Electromax" Temperature Controller

To meet the need for a temperature controller having high sensitivity and versatility and requiring a minimum of attention, the Leeds & Northup Co., 4934 Stenton Ave., Philadelphia 44, Pa., has placed on the market the L&N "Electromax" Temperature Controller illustrated herewith which can be used for the control of ovens, baths, stills, and other equipment. Especially designed for those applications where indicating and recording are not required, the controller is arranged to signal and control only, although temperature readings can be taken manually with the unit at any time.

The Electromax consists of a Wheatstone bridge circuit with a vacuum-tube amplifier as the detector. Vacuum tubes are standard and require no matching, balancing, or other special selection. The controller is completely a.c. operated.

Temperature-sensitive elements used with the Electromax are Thermohms—L&N resistance thermometer bulbs. According to the manufacturer, the length of lead wires does not affect calibration, and the location of Thermohms can be changed whenever desired. The instrument case measures 11⅞ x 11⅛ x 9⅛ inches and can be mounted wherever convenient. Standard ranges of the controller are 0 to 250 deg. F. and 0 to 1,000 deg. F., or the corresponding ranges of 0 to 150 deg. C. and 0 to 550 deg. C.

L&N "Electromax" Temperature Controller

HOWARD *has the* LAST WORD..

No. 351 New Howard Side Loading, Two Compartment Tumbling Mill for production tumbling and deburring of fragile parts without nicking! With exclusive media separating feature.

When it's production deburring and tumbling.

No matter how tough your jobs are—Howard Equipment can do the work. This new Mill, for example, does production deburring of fragile parts WITHOUT NICKING! They said it couldn't be done—but HOWARD DOES IT. Send sample parts for free processing and analysis.

Write for New 48-Page Catalog

MACHINERY FOR PICKLING • TUMBLING • DEBURRING • WASHING • QUENCHING • DRYING • BURNISHING

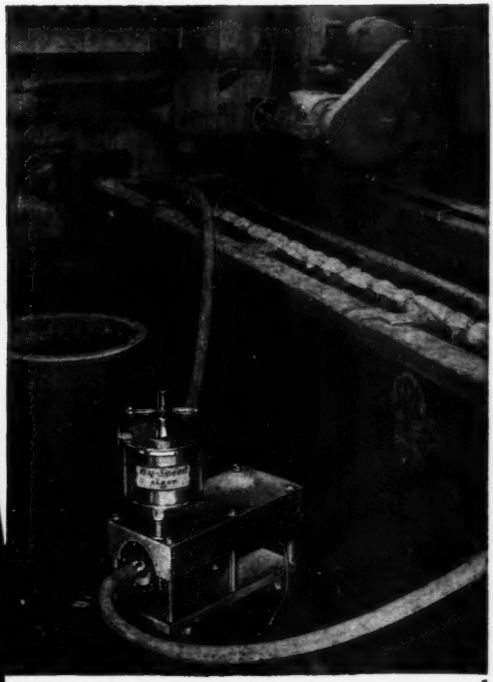
HOWARD

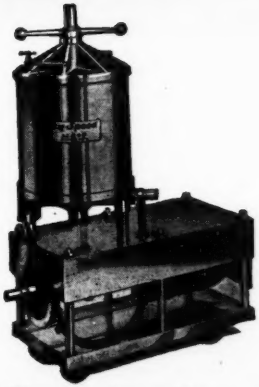
HOWARD ENGINEERING & MANUFACTURING CO.

2237 BUCK STREET
CINCINNATI 14, OHIO

The FILTER that Plating Shop Men Are Buying...

...ON ITS REPUTATION





This Filter complete as shown, requires very little floor space, though it is capable of handling as large a volume of solution as conventional filters many times its size.

Outstanding for protection against pitting, spotting, poor adhesion, formation of nodules, etc., which mean rejects and reworking "Sealed-Disc" Filters have won high reputation in plating rooms large and small all over the world.

You too, can take advantage of the savings in time and labor by using an Alsop "Sealed-Disc" Filter in your plant.

"Sealed-Disc" Filters remove all traces of dirt, dust, oil, sludge and all other impurities from plating solutions, yet will not effect brighteners. They are light, compact, portable and easy to move from one tank to another for instant use. Write for complete information or contact your regular plating supplier.

ALSOP

ENGINEERING CORPORATION

Filters · Filter Discs & Sheets · Mixers · Agitators

202 KEEN STREET MILLDALE, CONNECTICUT

DIPPING BASKETS

Every Basket Rugged and Strongly Braced

C. O. JELLIFF manufactures a complete line of dipping baskets, round and square, in sizes, mesh, and of metals and alloys to meet your requirements. Complete engineering service available to assist in solving your dipping basket problems.

WIRE CLOTH OF ALL MESHES IN ALL STANDARD METALS AND SPECIAL ALLOYS

WIRE PRODUCTS SINCE - 1860

The C. O. Jelliff Mfg. Corp.

124 Pequot Road
Southport, Connecticut

Fire Blanket

A fire blanket that is said to be a valuable safety and emergency aid to industrial plants, laboratories, and so on, is now being manufactured by the United States Rubber Company and distributed by Benson and Associates, Chicago, Ill. The blanket can be used as an emergency wrap if a person's clothing is aflame; as an auxiliary fire extinguisher to put out flames from vents, manholes, small containers, or tanks; as a fire shield so that fire fighters can approach within effective range of liquid fires; as a welding screen against welding rays and sparks, and as a salvage blanket to protect valuable materials from water, chemicals, etc.

Fire Blanket

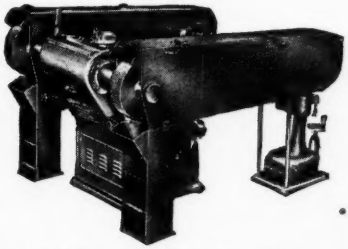
The fire blanket is 60 x 80 inches in size and made of high tensile strength glass cloth, impregnated on both sides with synthetic rubber. Hems and seams are vulcanized and folds are heat creased. It is provided with large brass gromets at the top and a weather-resistant bracket so that it can be hung up outdoors or indoors and easily removed or replaced. For quick identification, the blanket is red in color and marked with the words "Fire Blanket."

Qualities claimed for the fire blanket are that it is flameproof, heat-resistant, chemical-resistant, water-resistant, mildewproof, verminproof, non-shrinkable, and unaffected by heat or cold.

Hammond OF KALAMAZOO

BACKSTANDS

For converting standard Polishing Lathes into *high production* abrasive belt grinder-polisher units. Lifetime machine tool construction.



HAMMOND "VRO" Variable Speed (1500 to 3000 RPM) Polishing and Buffing Lathe with two No. 3 Backstands.

MODEL NO. 3 SHOWN. Write for new catalog No. 55 covering Backstands, Polishing Lathes and many types of Finishing Machines including Automatics.

VISIT OUR BOOTHS 235 & 239, WESTERN METAL CONGRESS, OAKLAND, CALIF., MARCH 22-27

Hammond Machinery Builders INC

1622 DOUGLAS AVENUE • KALAMAZOO, MICHIGAN

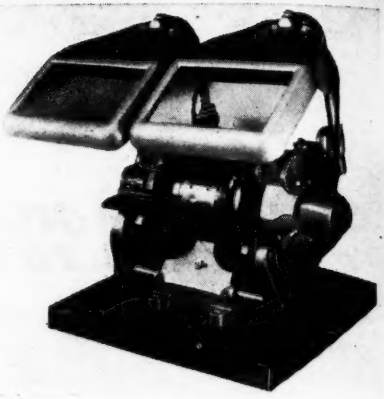
"Dulac" Lacquer No. 462

Said to permit accurate retention of all desirable surface qualities of most metals, including steel, aluminum, silver, brass, copper, magnesium, bronze, cadmium, and zinc, a clear universal lacquer to be known as "Dulac" No. 462 is now being marketed by the Maas & Waldstein Co., Newark 4, New Jersey.

Designed to afford lasting protection against heat, cold, weather, corrosion, stain, and perspiration, the lacquer is formulated to provide good adhesion with either the spray, dip, or brush method. According to the manufacturer, the lacquer produces an invisible film that dries out of dust in 5 to 10 minutes and hardens in 1 hour.

Surty Spotlight Shield

The Surty Mfg. Co., Inc., 4137 W. Kinzie St., Chicago 24, Ill., has placed on the market a spotlight shield for use in performing grinding, buffing, or polishing operations. Available in single and double-wheel models, the unit includes a spotlight attached to the underside of the shield, which can be adjusted for spotlighting the particular operation being performed. In this manner, complete safety is said to be afforded while working to maximum precision at high speed production.



Surty Spotlight Shield

The double-wheel model shield shown in the accompanying illustration includes windows that are each 8 inches wide, however, the shield can also be obtained with 10-inch wide windows if desired.

CLINCO QUALITY FINISHES

CLINCO can supply you with quality finishing materials to finish any item.

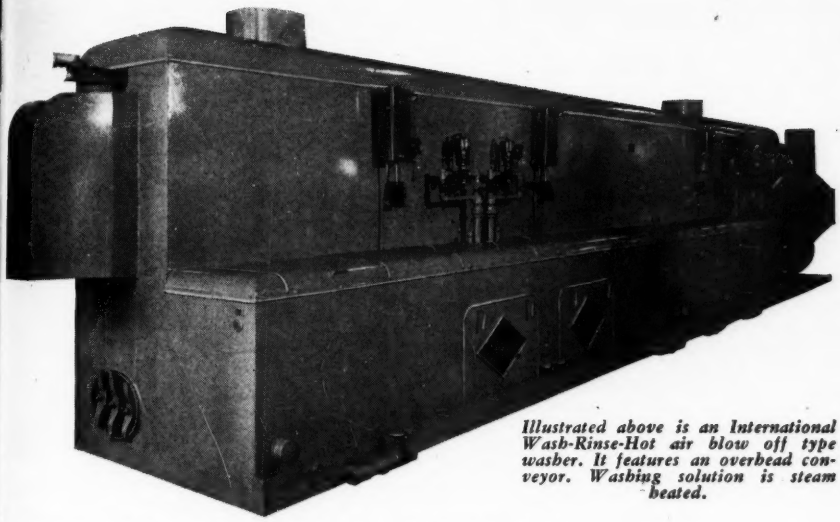
Write Today for Complete Details

Let us help you solve any particular problems you may have where quality finishes will help.

COUNT ON CLINCO FOR *Improved Synthetic Enamels*

For sure results use improved CLINCO Synthetic Enamels. One trial will testify to their superior quality.

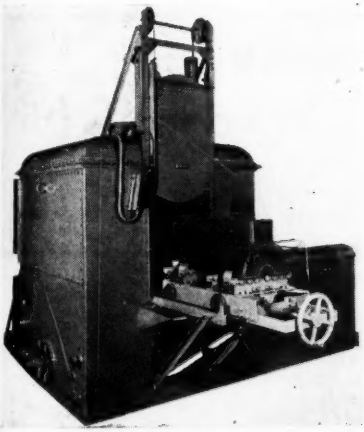
THE CLINTON COMPANY 1210 ELSTON AVENUE CHICAGO 22, ILLINOIS



Illustrated above is an International Wash-Rinse-Hot air blow off type washer. It features an overhead conveyor. Washing solution is steam heated.

INTERNATIONAL BUILDS INDUSTRIAL WASHERS

For Every Type of Business!



International Cylinder Block Precision Type Washer. Equipped with timing device to insure correct elapsed time for washing and rinsing.

Efficient design coupled with the excellent construction features embodied in International Washers make them outstanding, dependable and profitable production units. Among the features are rugged pressure pump; removable dirt catching screens for quick, easy cleaning; solution tank storage capacity from 2 to 3 times volume pumped per minute; full range of conveyors; choice of corrosion resistant spray nozzles — from mist to open stream; proper location of nozzles; welded fittings for all water, steam or gas and drain connections. Also specialize in building Bonderite Units.

Write for folder. Recommendations and quotations promptly supplied.

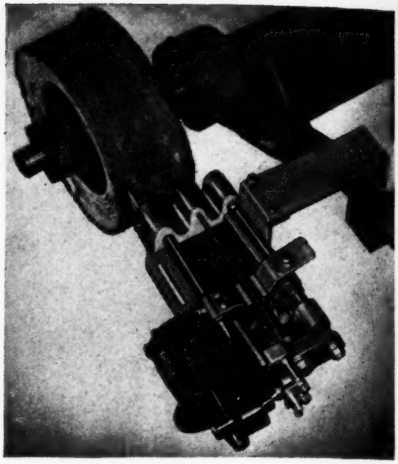
INTERNATIONAL CONVEYOR & WASHER CORP.
652 E. FORT STREET • DETROIT 26, MICHIGAN

"Paintbond" Solution

A solution for use in the simple, fast, economical preparation of aluminum and its alloys for painting or lacquering, to be known as "Paintbond," is now being offered by the Colonial Alloys Co., Technical Processes Div., Philadelphia, Pa. Used at room temperature for 30 to 60 seconds, the solution can be applied to any alloy of aluminum by the spray, brush, or dip method, the latter being preferable.

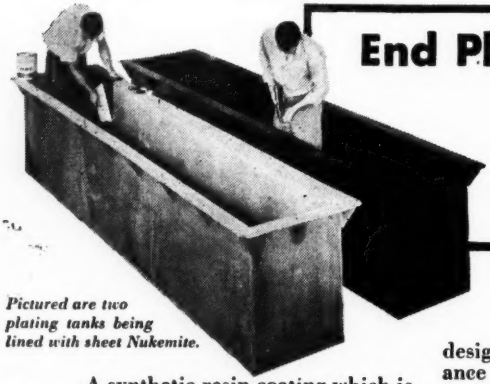
The procedure consists of freeing the aluminum of greases and dirts and immersing in the Paintbond solution for approximately 30 to 60 seconds and then rinsing and drying. The metal is now ready for painting and lacquering. Primers that are suitable for aluminum should be used prior to final finish coats.

Nankervis Buffing Compound Applicator



Installation view showing relation of Nankervis Buffing Compound Applicator to buffing wheel

A buffing compound applicator which has an intermittent feed control operating at the rate of 14 strokes per minute, thus affording a feed range of from 0.0015 to 0.015 inch per stroke, is announced by the George L. Nankervis Co., 5442 Second Blvd,. Detroit 2, Mich. The applicator



Pictured are two plating tanks being lined with sheet Nukemite.

End Plating Tank Worries with NUKEMITE

A synthetic resin coating which is immune to all commercial acids, alkalies and salt solutions, NUKEMITE is an ideal material for plating equipment. In liquid form it may be applied in manner similar to ordinary paints . . . providing excellent protection for structural work, machinery, floors, plating racks and other surfaces.

NUKEMITE is also available in sheet form and in this state is a most effective impervious lining for plating tanks. It is designed to give the best lasting performance under these operating conditions.

Write for descriptive literature or for any further information on NUKEMITE when used in sheet or liquid form in special applications. Complete Trial Kit of NUKEMITE available at $8.50 postpaid in the United States.

NUKEM Products CORPORATION
121 Colgate Ave., Buffalo 20, N.Y.

PLATING EQUIPMENT & SUPPLY CO.

USED EQUIPMENT—*Available Now!*

MOTOR GENERATOR SETS

1 Meaker—6000 Amps. @ 6 V., 3000 Amps. @ 12 V.
1 Bogue—5000 Amps. @ 8 V., 2500 Amps. @ 16 V.
1 G.E.—2000 Amps. @ 8 V., 1000 Amps. @ 16 V.
5 Metro Vickers—1600 Amps. @ 10 V. (DC or AC Motor-Driven)
2 H.V.W.—1000 Amps. @ 18 V.
1 Elec. Prod.—750 Amps. @ 12 V., 375 Amps. @ 24 V.
1 Chandeysson — 6000/3000 Amps. @ 3½/7 V. Several 5 to 50 V., 200-500 Amps. Sets Available
10 Hobart M.G. Sets—125 Amps. @ 7½ V.

RECTIFIERS

35 G.E.—500 Amps. @ 6 V.
2 Green—450 Amps. @ 48 V.
3 Udylite Mallory — 1440 Amps. @ 6 V.
1 Federal—400 Amps. @ 28 V.

GEHNRICH OVENS, Gas-Fired

1—54" Wide, 72" Deep, 7' High.
2—42" Wide, 48" Deep, 7' High.

10 U. S. Electric Buffers — Model 95—5 HP, 4-Speed machines.
1 Hawes-Double Head Flat Strip Automatic Polisher.
2 U.S. Double Spindle Polishing Machines, 2-3 HP Motors in base.
2 G.S. Blakeslee-Automatic Steam Washer.
1 Blakeslee Degreaser — Barrel Type—fully automatic—Steam Heated—Type P.H.L.L. 6760.
1 Pangborn Sand Blaster—Barrel Type—Model G.S. 2.
4 Lehman Sandblasting Cabinets.
1 Richardson Tumbling Unit — 6 Bbl.—Tilting Type.
14 Baird Tumbling Barrels—Tilting Type—No. 1 and No. 2.
4 Ransohoff Automatic Sawdust Drying Machines.
2 Sturgis Tumblers.

PLATING
EQUIPMENT & SUPPLY CO.

182 Grand St. **New York 13, N. Y.**

CANAL 6-3010-1-2

"If it's metal finishing equipment and supplies, *we have it.*"

can be mounted on any automatic machine (either right or left hand) and can be adapted to simple or complex multi-stage buffing operations.

The Nankervis Buffing Compound Applicator is driven by a totally-enclosed geared head motor, which is available for operation on 110, 220, or 440 volts. The quick-action compound applicator clamp with adjustable features to compensate for variable thicknesses and standard carrier is designed to accommodate any length stick of compound up to 4 inches. Special carriers for wider cakes can be obtained on order.

The Nankervis Buffing Compound Applicator has a total weight of 20 lb., thus enabling it to be readily adapted to floating heads without disturbing balance.

Surety "Griptite" Sureseal Glove

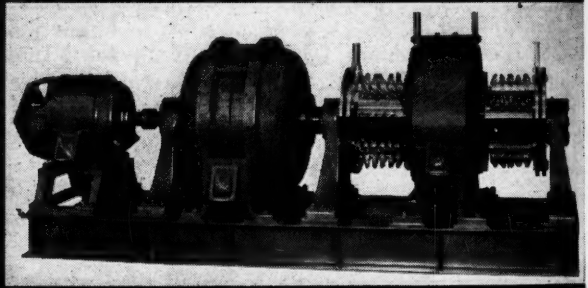
A synthetic rubber glove having a rough-surface finish which permits a non-slip grip even in liquids, to be known as the "Griptite" Sureseal, has been developed by the Surety Rubber Co., Carrollton, Ohio. An integral part of the glove, the finish, it is claimed, will not peel or wear off or loosen while working in liquids.

The Surety Griptite Sureseal Glove is available in all standard weights and sizes, in turn-cuff and regular gauntlet styles with curved or straight fingers.

Surety "Griptite" Sureseal Gloves

COLUMBIA MOTOR GENERATORS

for Electroplating and other Electrolytic Processes



Columbia Generators embody every feature essential for dependable, 24-hour operation. They are built for electroplating service in sizes of 6 to 20 volts, 500 to 20,000 amperes, for anodic treatment of aluminum in sizes of 40, 50, and 60 volts, 500 to 3,000 amperes. Columbia Generators for other electrolytic processes range from ½ to 250 KW, 100 to 40,000 amperes, 6 to 60 volts. Write for full information.

COLUMBIA ELECTRIC MFG. CO.
4519 HAMILTON AVE., N.E. CLEVELAND 14, OHIO

REQUEST: "SURFACE COATING WITH FLOCK"

Rayon Processing Co. of R. I., Inc.

PIONEER PRODUCERS OF SURFACE COATING FLOCKS

65 Tremont St. • Central Falls • Rhode Island

Sample Kit of Houghton "Cosmoline" Rust Preventives

Houghton "Cosmoline" Rust Preventives

Designated as the "Cosmoline," a series of nine rust preventives which are said to meet all peacetime manufacturing, shipping, and storage problems is announced by E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia, Pa. Of these corrosion preventives, four are of the removable thin-film solvent type, one is a non-removable dieletric variety, and four are oil-type films varying in viscosity from thin oil film to a medium grease consistency.

The new Cosmoline series of rust preventives include varieties for temporary intra-plant protection, as well as for shed and outdoor exposure. A handy kit containing samples of each preventive has been prepared for each of the company's representatives. The kit also includes steel strips, wipers, a small bottle of solvent, a descriptive folder, and a chart affixed to the lid describing the nine varieties, as shown in the accompanying illustration.

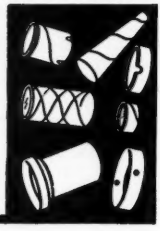
"Clearsite" Cleaning Cloth

A chemically treated cloth for the cleaning and fogproofing of eyeglasses, lenses, face shields, and windshields, to be known as the "Clearsite," is announced by Clearsite Laboratories, Dept.

What will dust and moisture do to your fine fittings?

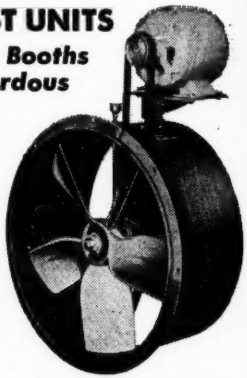
PRECISION DUST CAPS AND THREAD PROTECTORS

Perfectly safeguard exposed ends, coils, forms, etc., in transit or storage. Strong, spirally wound fibre, formed to seal *any shape*, inside or outside. Write for samples.



PRECISION
PAPER TUBE CO.
2053 W. Charleston St., Chicago 47, Ill.

EXHAUST UNITS
for Spray Booths and Hazardous Locations



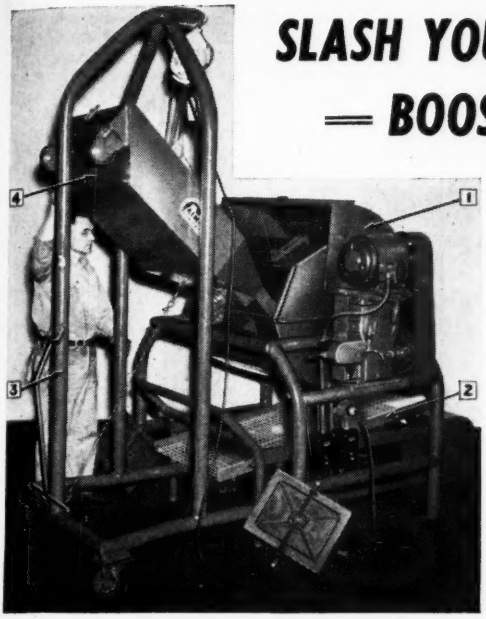
Fan Sizes 12" to 42"

Free Delivery C. F. M. 900 to 29200

Immediate Deliveries from Stock.

Also Manufacturers of a complete line of waterwash and dry type paint spray booths with accessories. *Send for details.*

M. & E. Manufacturing Co.
2571 Winthrop Ave.
Indianapolis • Indiana



SLASH YOUR LABOR COSTS — BOOST YOUR OUTPUT

With This

PROVEN

ALMCO

PRODUCTION

TEAM

●

This "team" of related Almco units saves time and effort at every point—provides *unequaled output* with *tremendous labor savings* in precision deburring and finishing. Note these outstanding advantages:

1 ALMCO 4-SPEED TUMBLING BARREL. 11 sizes; welded steel, plain or neoprene lined. Has light-weight doors, clamped by lever; extra-wide openings; hydraulic brake; quick speed change.

2 PORTABLE POWER SCREEN. Fits under barrel. Quickly separates load on discharge. Screen size readily changed.

3 MOBILE ELECTRIC HOIST. For lifting and transporting abrasive in hoist pan. Eliminates hand loading of barrel. Rolls freely on ball bearing casters.

4 MOBILE HOIST PAN. Fits under screen and barrel; moves on casters. Covered snout facilitates pouring. Drain-off provided.

5 TWO-COMPARTMENT STORAGE HOPPER (not shown). Gives quick discharge of abrasive into hoist pan through non-sticking lever-operated valves. Sloping bottom assures free flow.

Write today for FULL DETAILS, No obligation, of course.

DISTRIBUTORS: *The above features, plus many others, make this a worthwhile line to handle. We invite your inquiries.*

ALMCO INCORPORATED

ALBERT LEA • MINNESOTA

THE
VARNISH PRODUCTS CO.
MAKERS OF
CEL-U-LAK Lacquers and Enamels
FORM-A-ROC—alkyd-amine enamels
ALSO
Bronzing vehicles, adhesives and other specialties for the industrial finishing of wood, metal, ceramics and plastics.
5206 HARVARD AVENUE
CLEVELAND, OHIO

Harrison 4-A Products
SUPERIOR COMPOUNDS
for
Cutting—Cut and Color
Mirror Finishing
Mean
FASTER CUTTING
INCREASED PRODUCTION
GREATER ECONOMY
Write us for samples to meet your special needs
HARRISON & COMPANY
Haverhill, Mass.

D-1, 6100 Butler St., Pittsburgh 1, Pa. To use, the cloth is simply wiped on the surface of the object to be cleaned.

Said to leave no sticky substances on the hands, the Clearsite Cleaning Cloth is designed to readily fit into the drawer of a workbench and is available in three different grades; No. 100 for eyeglasses; No. 200 for goggles, gas masks, and face shields; and No. 300 for windshields.

"Stop-Fire" Extinguisher

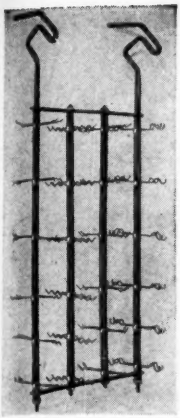
An underwriters'-approved stored-pressure hand extinguisher to be known

"Stop-Fire" Extinguisher

as the "Stop-Fire" is now being manufactured by the Union Stop-Fire Corp., 4th Ave. and Pacific St., Brooklyn 17, N. Y. Easy to use, the extinguisher includes a shoulder sling for suspending the tank in an out-of-the-way position.

The Stop-Fire utilizes a mixture of carbon dioxide and carbon tetrachloride to produce a chemical of unusual effectiveness in extinguishing fires. Shot as a fine spray from the extinguisher, the doubly-effective chemical is said to be instantaneously converted into a heavy fire-smothering gas. Even fires of the most stubborn kind—oil, ether, gasoline, electrical—are claimed to be blanketed and snuffed out in a matter of seconds.

The Stop-Fire Extinguisher has a long range, the bulk of the stream traveling



NEW • MODERN • EFFICIENT

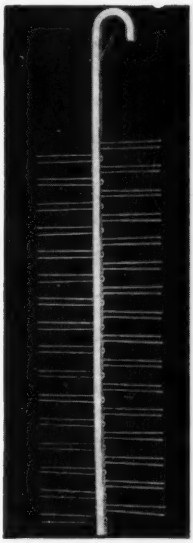
SPECORAK

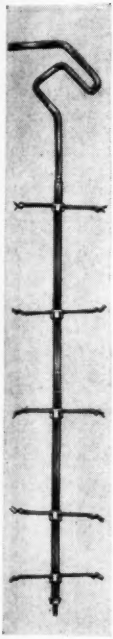
Trade Mark Registered

PLATING RACKS

Save Labor, Time, Material, Current

Designed by Special Chemicals Plating Engineers. These racks fill a long felt want of industrial, jewelry, novelties and other metal manufacturers for plating racks as standard equipment that can be insulated.



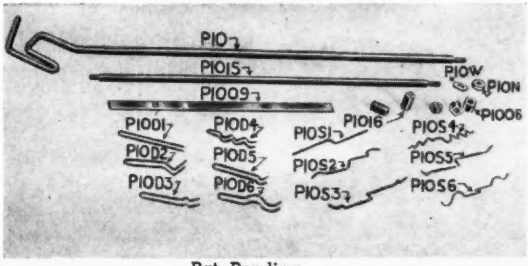


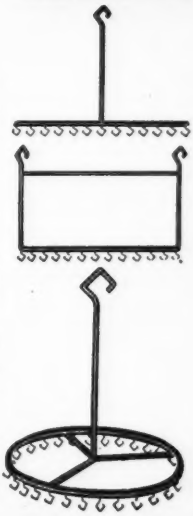
- **Indispensable for plating Nickel, Chromium, Rhodium, Gold, Silver, etc. Equally economical for lower priced plating materials.**
- **Made in variety of standard sizes and shapes.**
- **Cost less than to build your own.**
- **Assure constant economy and efficiency of operation.**
- **Reduce losses to a minimum.**
- **Increase output capacity with no increase in power.**
- **Speed up loading and unloading.**
- **For most any size or shape tank.**

The new design of SPECORAK is of quick assembly type. All parts are separate units, can be assembled into custom made rack in 5 minutes time. Assembling the various parts, placing in a vise and tightening the nut gives a finished rack except for coating. SPECORAK standard parts are always reusable for redesign.

SPECORAKS start saving you money the very first day you start using them.

Send for illustrated descriptive folder.





Pat. Pending

SPECIAL CHEMICALS CORP.

30 IRVING PLACE, NEW YORK 3, N. Y.

anywhere from 15 to 25 feet. The fluid is said to be effective indefinitely, with the result that the tank does not have to be refueled except when entirely empty. A pressure gage attached to the extinguisher indicates fluid pressure.

The Stop-Fire Extinguisher is manufactured of 85-15 brass which is said to be non-corrosive and to eliminate the possibility of oxidation.

AO Rubber-Frame Goggle

A rubber-frame goggle equipped with a large, single acetate lens and specially designed to protect workers against chemical and dust hazards is announced by the American Optical Co., Southbridge, Mass. The goggle can be readily worn in combination with the company's R-1000 respirator.

According to the manufacturer, the AO Rubber-Frame Goggle provides for unusual wide-angle vision, good ventilation, and long wearing comfort, and may be worn directly over the eyes or over most types of prescription glasses. Recommended for wear on jobs involving the handling of acids and caustics, the goggle is claimed to protect against chemical splashes, spray and impact of foreign particles, and exposures to fine dust concentrations. It is said to be particularly applicable in maintenance work on acid lines; repairing and maintaining storage batteries; working on metal-plating baths; cleaning and degreasing

AO Rubber-Frame Goggle

Clean Spray Booths

Spray BOOTHCOTE on clean booth.
Paint peels off in sheets.
NO SCRAPING—SAVE TIME and LABOR
Trial offer 15 gals. $13.50 F.O.B. Buffalo
Used by 2000 leading manufacturers.
MONEY BACK IF NOT PLEASED.
Write for Circular.
HYGRADE FOOD PRODUCTS CORP.
HARRIS SOAP—BOOTHCOTE DIV.
19 Stetson St., Buffalo 6, N. Y.

PLASTEX
(Trade Mark Reg.)
COLOR COAT
A BEAUTIFUL PROTECTIVE FINISH
For ALUMINUM, MAGNESIUM
ZINC, BRASS, STEEL

- **Adheres To Any Surface**
- **TOUGH and FLEXIBLE**
- **WATERPROOF**
- **Resists Most ACID, ALKALI or BRINE SOLUTIONS or VAPORS**
- **Unaffected by ALCOHOL, LUBRICATING OILS or GASOLINE**

Supplied Clear and in 19 Colors.
Write for Color Card Today.
MERIDIAN DISTRIBUTORS, INC.
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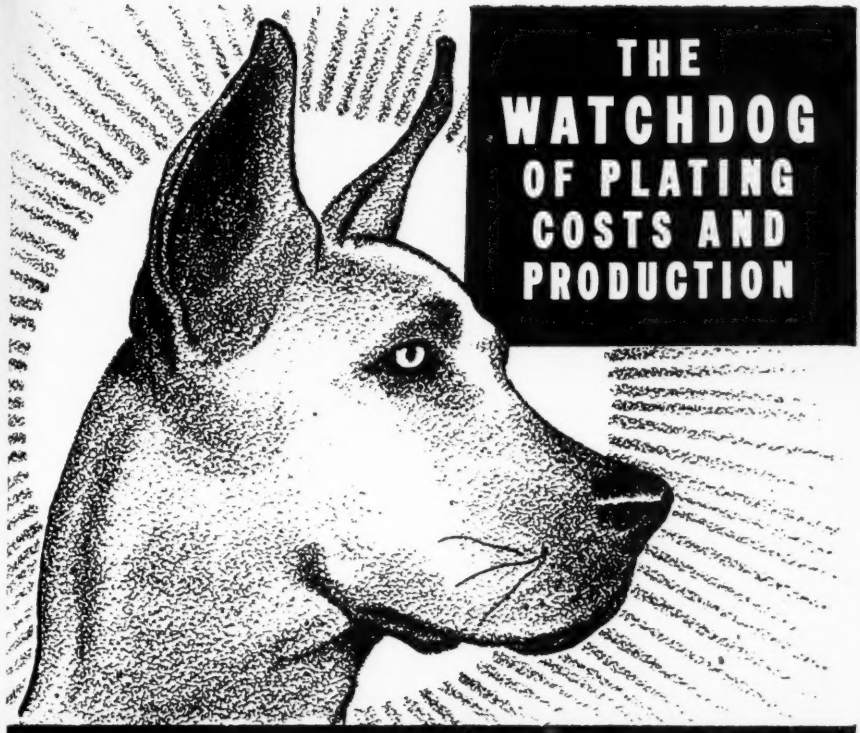


THE WATCHDOG OF PLATING COSTS AND PRODUCTION

BUNATOL 785 is your plating room's most efficient watchdog . . . Though tough on those thieves that steal your profits in decorative plating, — whether Nickel, Chrome or Copper, — it is gentle to apply and never growls at hot cleaners or strong acid or alkali solutions. Stands rough handling because of its greater adhesion, greater flexibility . . . Cuts rejects to an infinitesimal minimum. Easily applied, easily patched. Cuts costs, speeds production . . . A generous sample sent upon request.

NELSON J. QUINN COMPANY, TOLEDO 7, OHIO

BUNATOL 785

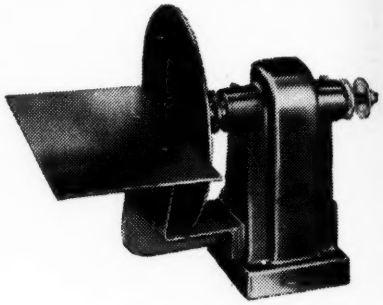
operations where caustics and acid solutions are used; shake-out work in foundries; railroad car cleaning, and so on.

The close-fitting face-form frame of the goggle is molded from non-irritating, acid-resisting synthetic rubber. Perforations at the top and sides of the goggle allow ample ventilation to reduce the possibility of fogging. The goggle is equipped with a large acetate single lens of slow-burning and shatter-resistant design and is made to conform to high optical specifications for clear, undistorted, wide-angle vision. The goggle is so designed that the lens can be easily replaced if necessary.

Lake Disc Sander and Polishing Head

A combination disc sander and polishing head for use in performing sanding, polishing, grinding, burring, and other operations is now being produced by the Lake Manufacturing and Engineering Co., 507 Industrial Bldg., Syracuse 4, N. Y. The hooded frame of the unit is made of cast aluminum and the arbor and flanged spindle collars are of precision machined steel.

The drive can be applied from below or behind with a ½-inch V-belt. Two individual V-pulleys located on the arbor provide for a wide speed range and permit adjustment to eliminate end play in



Lake Disc Sander and Polishing Head

the shaft. The head is designed to drive a wide variety of accessories and is bossed on both sides to accommodate brackets and tables. Attachments are available for performing buffing, wire brushing, grinding, drilling, and so on.

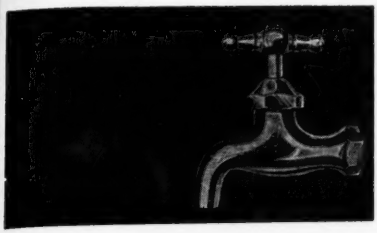
FILMITE

A SAFE, QUICK
WAY TO REMOVE OVERSPRAY
FROM DRY WALLS IN PAINT BOOTHS
WITH A 90% COST SAVING METHOD
FOR DETAILS WRITE

The Du Bois Company
CINCINNATI 3, OHIO

ALLWOOD
"Vienna Brand" Lime
Made from Limestone that is identical in chemical analysis and geological structure with European Imported Lime. Tests show a "lime cake" made from Allwood "Vienna Brand" Lime equals the finish made from imported lime.
WRITE FOR FULL PARTICULARS
ALLWOOD LIME COMPANY
Manitowoc • Wisconsin

RANDALL for TANKS
ALLOY — RUBBER — LEAD
GAS—STEAM—ELECTRIC HEATED
—DEGREASERS—
POLISHING LATHES
EXHAUST SYSTEMS
RANDALL WELDING WORKS
410-412 E. 93rd St. New York 28



LUSTREBRIGHT

Bright Nickel Process

Produces Brilliant Adherent Nickel Deposits. Ideal Base for Chromium.

No color buffing • No re-cleaning • No re-racking • No special solutions. Merely add to cold nickel solution, still or mechanical • No extra equipment.

Guaranteed not to harm Nickel Solutions

Illustration shows unbuffed deposits before and after Lustrebright.

Write for complete information.

W. C. BRATE COMPANY

Established 1860

16 MARKET ST. **ALBANY, N. Y.**

Klarifiant

FOR MAXIMUM EFFICIENCY IN WATER CURTAIN SPRAY BOOTHS

Eliminate

PLUGGED NOZZLES

•

WATER BREAKS

•

SCALE-CLOGGED LINES

•

SLUDGE IN RESERVOIR

•

LOSS OF PRESSURE

FOR DETAILS WRITE

The Du Bois Company

CINCINNATI 3, OHIO

Grainlock

Polishing Wheel Cement

We Do Not Send Samples

Better Still, We Bring Them To You

Your Job Is Set Up To Your Entire Satisfaction

You Cannot Beat This Offer or The Results Obtained

Write Us Today

INDUSTRIAL LUBRICANTS COMPANY

5736 TWELFTH STREET **DETROIT 8, MICHIGAN**

Miccroplastic Heat-Cured Rack Coating

Said to combine all of the characteristics and advantages of live rubber with the chemical resistance of the newer synthetic coatings, a heat-cured rack coating to be known as Miccroplastic has been added to the line of Miccro products offered by the Michigan Chrome and Chemical Co., 6340 E. Jefferson Ave., Detroit 7, Mich. Non-inflamable, the coating, according to the manufacturer, offers complete protection to racks through all metal-finishing operations, including electrolytic polishing, hydrofluoric etching dips, and plating baths—copper, nickel, chrome cycles and all phosphate coatings.

Miccroplastic, which has a solids content of approximately 100 per cent, is readily applicable by the dip method, and can be used as supplied and easily and quickly patched if necessary. Tough and flexible, with good impact and abrasion resistance and positive adhesion, the coating, it is claimed, is inert to the chemical action of acids and electrolytic alkaline solutions above 212 deg. without deteriorization and is designed to minimize dragout. Miccroplastic will not contaminate any plating bath and can be used in all plating cycles, thus eliminating reracking, the manufacturer states.

DuBois Improved "Actusol" Degreasing Agent

Described as completely ordorless, an emulsifiable oil detergent with greatly increased degreasing and emulsifying power is now being marketed under the name of "Actusol" (Improved) by The DuBois Co., Cincinnati 3, Ohio. As a solvent cleaner, diluted with kerosene, or as an emulsion wash, the product can be safely used on all metals, plastics, and finishes, it is claimed. The high emulsification power and complete water rinsibility of the product provide for economy of application.

According to the manufacturer, the DuBois Improved Actusol is particularly useful where heat is unavailable, for cleaning assemblies containing soft or finished parts, as an additive to activate cleaning baths, as a presoak, and where interim rust-inhibiting is desirable. On the production line and in maintenance, Actusol is said to perform rapidly and efficiently.

SURETY'S NEW GRIPTITE FINISH!

now available on Surety Sureseal synthetic rubber gloves

. . . . THIS NON-SLIP SURFACE . . WILL NOT PEEL OR RUB OFF

• NO SLIPS — even when working in liquids! New Griptite gloves never shed their unique rough finish. In all sizes, styles. Especially valuable for work in chemicals and acids. . . . • Write for bulletin.

THE SURETY RUBBER CO.

CARROLLTON, OHIO

The New Miracle Finish

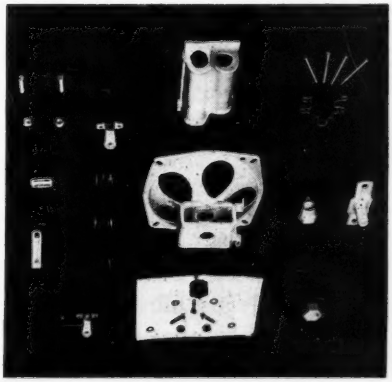
IRCO-Seal

- **The IRCO-IZING PROCESS plus IRCO-SEAL is a complete metal preparation and finish in one operation.**

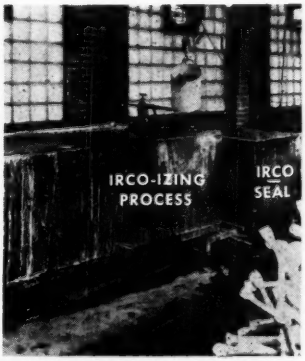
IT SAVES COST AND LABOR • EASILY SET-UP • SIMPLE TO MAINTAIN • IRCO-SEAL CAN BE DIPPED OR SPRAYED.

After the metal emerges from the IRCO-IZING bath, *it need not be dried* before application of IRCO-SEAL.

IRCO-SEAL is a satin-like organic *finish, durable, will not clog threads,* and dries rapidly.



- **Above are some articles finished with IRCO-SEAL (Note the smooth finish and unclogged threads) 300 HOUR SALT SPRAY RESISTANCE**



The IRCO-IZING PROCESS is a hot zinc phosphate treatment for iron, steel, zinc and cadmium, providing a rust inhibiting phosphate base for all finishes.

IRCO-SEAL is immediately available in the following colors:

- **Bright metallic (Replaces Plating)**
- **Brown**
- **Mahogany**
- **Blue**
- **Black**

INTERNATIONAL RUSTPROOF CORPORATION

CLEVELAND OHIO

"Hydro-Whirl" Dust Collectors. Peters-Dalton, Inc., 17908 Ryan Rd., Detroit 12, Mich., now has available an attractive 16-page technical bulletin on its "Hydro-Whirl" Wet Type Dust Collectors. Included is illustrated information on styles, applications, advantages, and sizes, as well as engineering data for use

in the planning and installation of a Hydro-Whirl system.

Copy of Technical Bulletin No. 101 can be obtained free of charge by executives addressing requests on their company letterheads.

"Hydro-Whirl" Spray Booths are featured in a second 16-page technical bulletin published by Peters-Dalton, Inc. In addition to a preface on Hydro-Whirl history, the bulletin includes illustrated data on batch type spray booths, down-draft spray booths, conveyorized spray booths, and the salient features and advantages of Hydro-Whirl spray booths. Moreover, the bulletin contains helpful charts and information on how to select a Hydro-Whirl spray booth according to individual requirements.

Copy of Technical Bulletin No. 201 is available free of charge to mechanical executives addressing requests on their company letterheads.

B. F. Goodrich Sandblast Hose, designed specifically for conducting sand and other abrasive materials at high velocities for cleaning, cutting, or finishing castings, stone, glass, and other surfaces, is the subject of a catalog leaflet published by The B. F. Goodrich Co., Akron, Ohio. The leaflet describes the construction of the product and provides data on sizes, weight per 50 feet, and outside diameters. Copy is available free by requesting Catalog Section 4440.

CUT DRYING TIME
from
Hours to Minutes
with
NALCO
INFRA-RED LAMPS

Quick, penetrating heat of Nalco Infra-Red Lamps is easily controlled. Can be used on large or small jobs for speed and efficiency. Write for "Drying Problems Made Easy."

NORTH AMERICAN ELEC. LAMP CO.
1030 Tyler St. St. Louis 6, Mo.

GOLD PLATING SOLUTIONS
In All Colors
Guaranteed 100% Pure Gold Content
Troy Weight - Color Constant
Tarnish Resistant
Proven Quality by the Acid Test
Write or call our experts about your plating problems

Davis-K-Products Co.
114 Lexington Ave., New York 16, N. Y.
Lexington 2-7360
2-5816

A New Aid to Pickling
NEPTUNE
(Pickling Accelerator)

1. Reduces fumes
2. Conserves acid
3. Prolongs life of solution
4. Reduces drag out

THE WM. M. PARKIN CO., • Highland Bldg., Pittsburgh 6, Pa.

For Stripping Copper

McKeon's

"Liquid Sulphur"

No etch. Simple — Non-Dangerous. Used in America's largest Plants.

ORDER ON APPROVAL

Sulphur Products Co.

Greensburg 6, Pa.

Are you rumbling around for a way to polish metals? Why not check Lupomatic's method.

For efficiency in finishing metal parts, install a DEBURRMASTER.

Save time, money and produce assured results.

LUPOMATIC TUMBLING MACHINE CO., INC.
4510 BULLARD AVE. BRONX, N. Y.

Better Finishing FASTER

with

Hisey BUFFERS POLISHERS

Available in capacities for 1 to 10 H.P., Hisey Buffing and Polishing Machines are designed to give you maximum working efficiency.

Spindles are mounted well forward for greater ease in handling large or awkward pieces. The Vee Belt Drive affords any desired spindle speed regardless of motor speed. Spindle and housing may be removed as a unit without disturbing bearings. Belts, while fully guarded, are easily accessible for adjustment or replacement.

Write us today for Catalog 70AK

Hisey THE HISEY-WOLF MACHINE CO. CINCINNATI, OHIO.

The Finishing Touch — By J. A. Patterson

"Know what — I miss th' pretty faces of th' girls that usta' work here during the war."